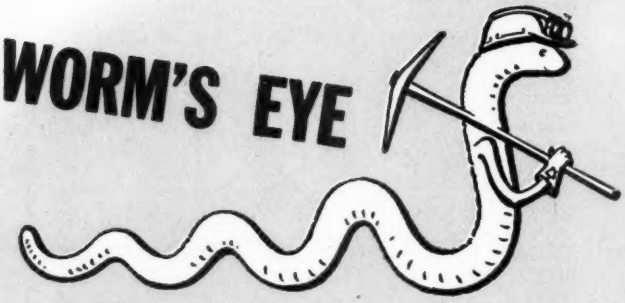
Mining

CONGRESS JOURNAL

OCTOBER
1945

WORM'S EYE VIEW



OF THE NEW WESTINGHOUSE 26-INCH LOW LINER

Railroad Clearance on a Mine Locomotive

Electrification of mine equipment—the quickest means of getting "more coal per hour"—has been the responsibility of Westinghouse engineers for many years. Their background of "on-the-job" knowledge and experience assures the purchaser of Westinghouse Mine Locomotives of:

More coal per hour . . . 100% performance, day in and day out . . . under grueling operating conditions, safeguarded by carefully planned construction features.

Service and parts as near as your telephone . . . Westinghouse Maintenance Service is at the command of mine operators.

For complete proof examine this 'Worm's Eye View' of the Westinghouse Low Liner . . . and consult your Westinghouse office, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-15113

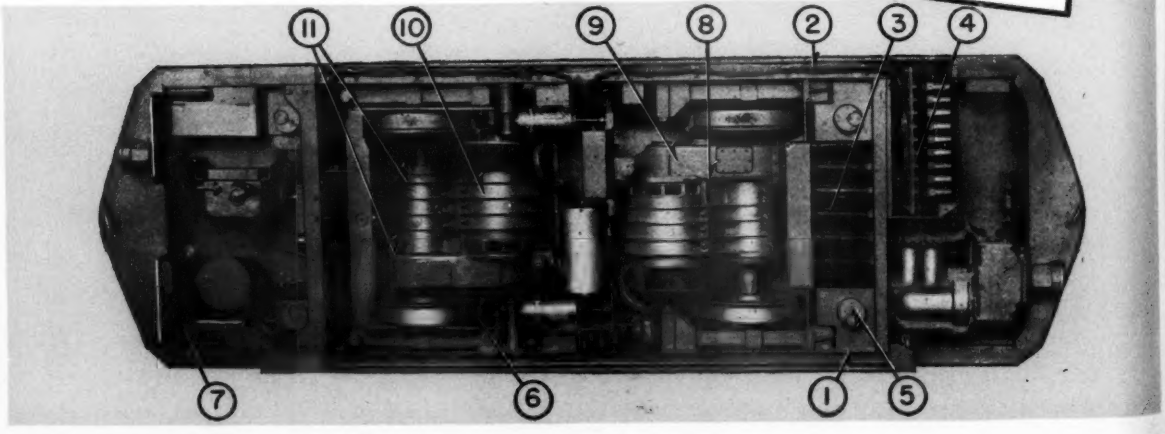
Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

MINE LOCOMOTIVES

CONSTRUCTION FEATURES

1. Piping laid in trough on top of side frame with free access to every union, cock and joint.
2. Wiring enclosed in hose—placed in trough of side frame.
3. Resistor mounted in one accessible frame—reducing wiring to minimum.
4. Pneumatic contactors mounted adjacent to, but well protected from resistor.
5. Sand boxes with capacity normally found on higher locomotives.
6. Solid brake pull rods—instead of chains.
7. Side frames and bumpers are held together by tapered, reamed driven-through bolts.
8. Motor and drive unit mounted in same gear casting.
9. Gearing of spur design—shafts mounted parallel to motor armature shaft.
10. No external couplings or drive parts. All wearing parts internally mounted and continuously lubricated.
11. Complete motor and gear assembly easily removed in same manner as axle-hung motor.
12. All equipment on locomotives accessible without removing adjacent parts.



Mining Congress Journal

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VOLUME 31, NUMBER 10 — FOR OCTOBER 1945

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FRONT COVER: Tandem strip and coal loading operations simultaneously finishing a cut at Wilmington No. 10 Mine in Northern Illinois.

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Opinions expressed by authors within these pages are their own, and do not necessarily represent those of the American Mining Congress

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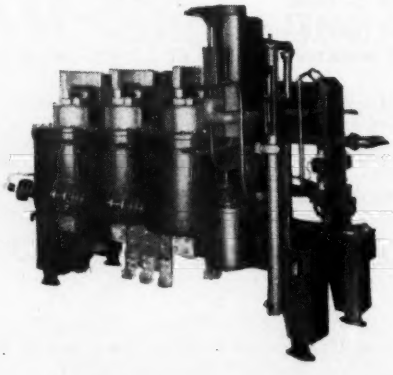
ABC

YOU CAN SAVE HUNDREDS OF KW Here...

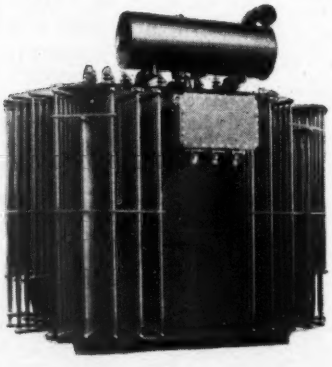
dc to dc

Equipment for MERCURY-ARC



IGNITRON RECTIFIER

G-E ignitron mercury-arc rectifiers are made in ratings of 75 kw and higher, 250 to 900 volts. Typical 6-anode and 12-anode pump-tank rectifiers consist of ignitron tanks, vacuum and water pumps, static magnetic firing circuit, and a temperature regulator. In electrolytic ore reducing plants, several rectifiers are usually operated in parallel at voltages from 350 to 900 volts. They are not affected by corrosive fumes and are readily put into service after a shut down.



RECTIFIER TRANSFORMER

A typical G-E transformer for mercury-arc power rectification combines in one unit the step-down transformer; an interphase transformer to maintain proper distribution of load current in the secondary windings; and a surge absorber to protect the d-c windings against high-voltage surges. The transformer can be Pyranol* filled or oil-filled; and can be self-cooled or water-cooled.

*Trade-mark reg. U.S. Pat. Off.

Cut the Cost of ELECTROLYTIC ORE REDUCTION

WITH G-E IGNITRON MERCURY-ARC RECTIFIERS

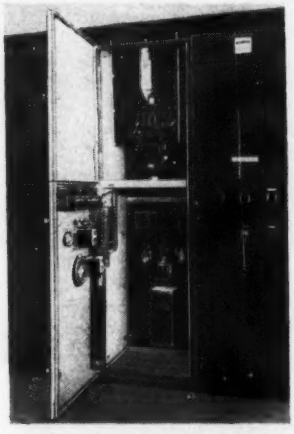
They maintain a remarkably high conversion efficiency over a wide load range. For example, at a rated load of 7000 kw, 600 volts, an ignitron rectifier saves 350 kw, compared with a synchronous motor-generator set. Apply this saving to a year's operation and you can see how many kilowatt-hours will be conserved for electrolytic ore reduction.

An ignitron rectifier requires very little maintenance. It starts quickly—it's ready for immediate service. There is no starting-inrush current. Installation is simple. No special ventilating systems, filters, or noise absorbers are required.

More than 350 electrochemical plants whose direct-current power requirements range from 250 to 900 volts use G-E ignitron mercury-arc rectifiers. They are producing zinc, copper, aluminum, and magnesium efficiently and economically.

Our local office can help you with any direct-current power problem you may have. For further information about G-E rectifiers and accessory equipment, write for your copy of Bulletin GEA-3706A. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

RECTIFICATION



RECTIFIER SWITCHGEAR

For control and protection of the rectifier and transformer, G.E. offers completely co-ordinated metal-enclosed switchgear equipments consisting of: vertical-lift metal-clad switchgear for the a-c power circuits, heavy duty d-c rectifier switchgear, and for large installations, duplex control switchboards for centralized control and protection.

Buy all the BONDS you can— and keep all you buy.

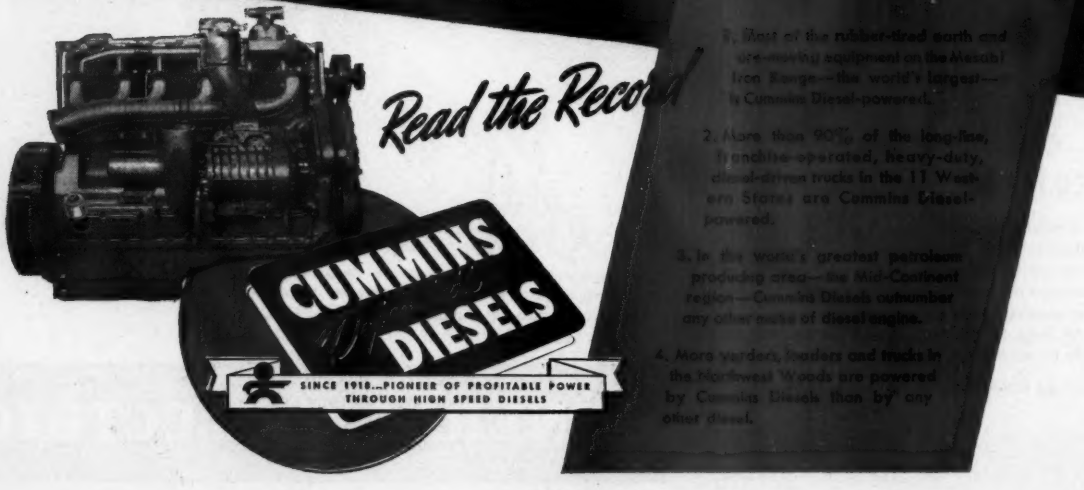
Typical G-E ignitron mercury-arc rectifier installation in electrolytic reduction plant.

GENERAL ELECTRIC

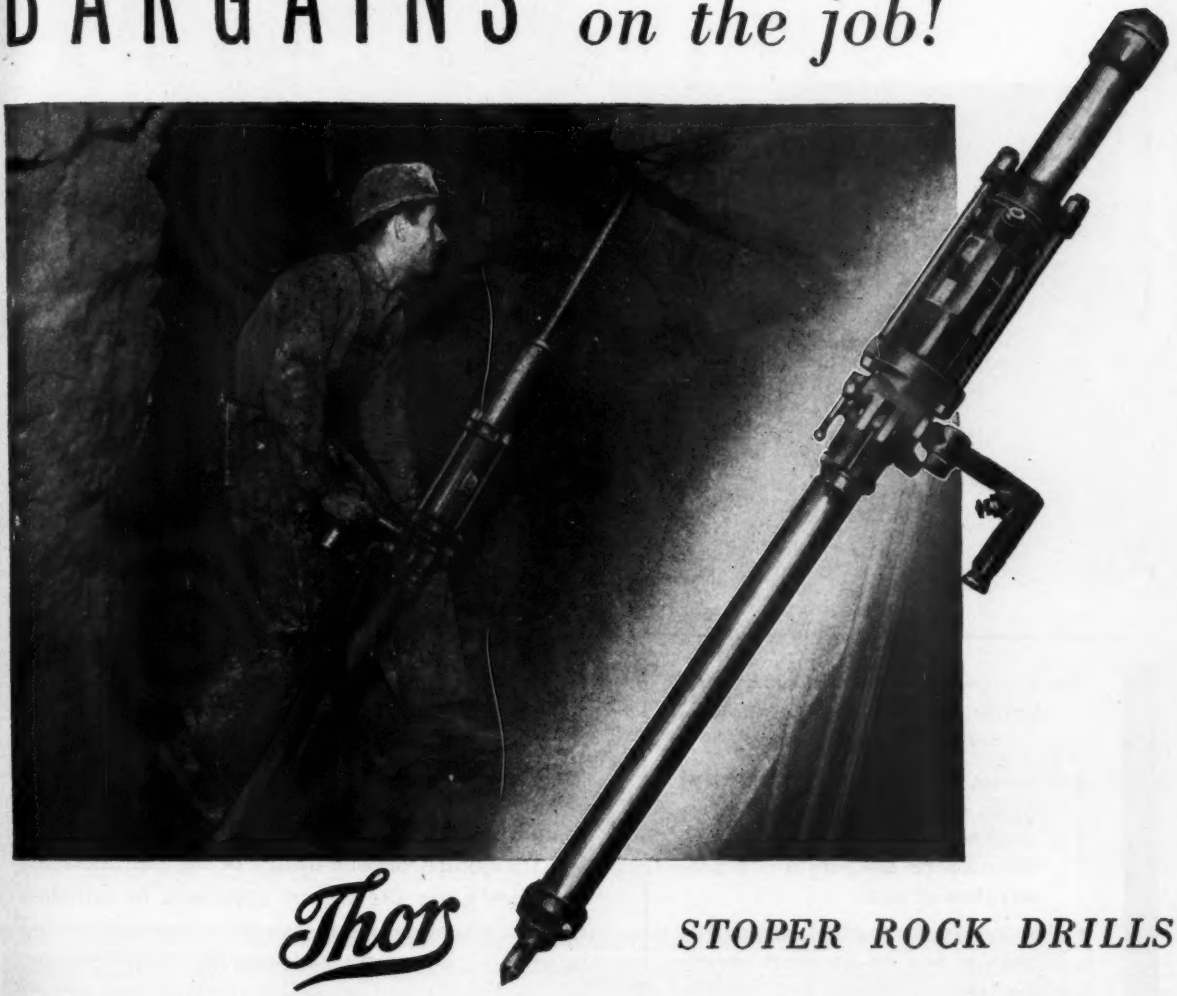
POWERED FOR higher PROFIT

Consider these advantages in standardizing on Cummins Dependable Diesels for your heavy-duty power requirements—automotive, portable or stationary. Three models—150, 200 and 275 hp—have the same basic design and practically the same mounting dimensions . . . weights as low as 10½ pounds per horsepower . . . many interchangeable parts . . . a single service procedure. Results: in effect, you meet varying power needs with "one engine" . . . you save engine weight and space . . . you reduce parts inventory . . . you simplify the mechanic's job, cut service costs.

CUMMINS ENGINE COMPANY, INC., Columbus, Indiana


Read the Record
CUMMINS
DIESELS
SINCE 1919...PIONEER OF PROFITABLE POWER
THROUGH HIGH SPEED DIESELS
2. More than 90% of the long-line, franchise-operated, heavy-duty, diesel-driven trucks in the 11 Western States are Cummins Diesel-powered.
3. In the world's greatest petroleum producing area—the Mid-Continent region—Cummins Diesels outnumber any other make of diesel engine.
4. More yarders, loaders and trucks in the Northwest Woods are powered by Cummins Diesels than by any other diesel.

BARGAINS *on the job!*



Thor **STOPER ROCK DRILLS**

Built to provide more footage, longer life and lower operating cost, Thor Stopers are real bargains *on the job!* They cost no more than ordinary rock drills, yet have greater power with exceptionally low air consumption, automatic lubrication, streamlined design and balance, and many other outstanding features. They are making money—*faster*—for Thor owners everywhere. Find out *now* what they could do for you. Write for Catalog 42-A.

INDEPENDENT PNEUMATIC TOOL COMPANY
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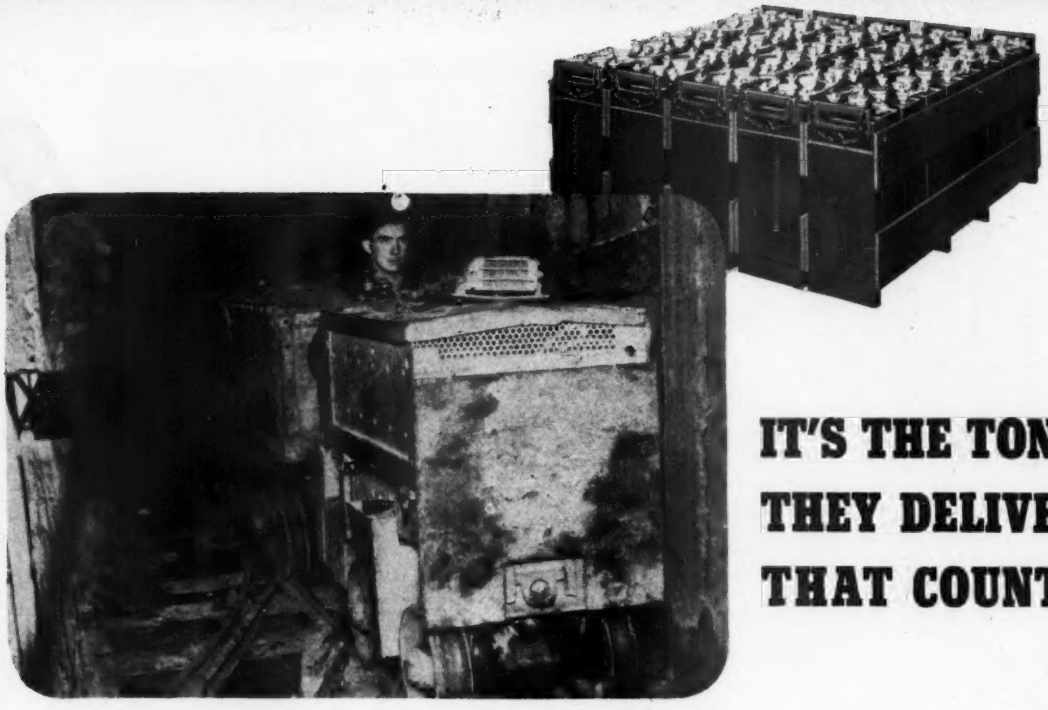
Pittsburgh Salt Lake City St. Louis San Francisco Toronto, Canada London, England

Thor **PORTABLE POWER TOOLS**

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS



IT'S THE TONNAGE THEY DELIVER THAT COUNTS

In Mine Locomotives and Shuttle Cars Alkaline Batteries Give You These Important Advantages

- They are **durable mechanically;** grids, containers and other structural parts of the cells are of steel; the alkaline electrolyte is a preservative of steel.
- They are **foolproof electrically;** are not injured by short circuiting, reverse charging or similar accidents.
- They can be **charged rapidly;** do not require critical adjustment of charge rates; can be charged directly from mine d-c supply.
- They **withstand temperature extremes;** are free from freezing hazard; are easily ventilated for rapid cooling.
- They can **stand idle indefinitely** without injury. Merely discharge, short-circuit, and store in a clean, dry place.
- They are **simple and easy to maintain.**

Keeping maximum production of coal or ore coming out puts a premium on availability of underground haulage and tramming equipment.

Time and experience have demonstrated that the unequaled dependability of Edison alkaline batteries gives the closest approach to failure-free, uninterrupted haulage it is possible to obtain. They stay on the job and out of the repair shop . . . give longer service life than any other type of battery. In fact, alkaline batteries that have been "worn out" in locomotive or shuttle-car service, are often used for various kinds of lighter duty standby work for which their capacity is still ample, and there deliver more years of dependable service.

Because they give such long, trouble-free life and are so simple to maintain, alkaline batteries also help keep down haulage costs. *Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J.*

Edison
ALKALINE BATTERIES

STRETCHEROO

S-t-r-e-t-c-h . . . S-t-r-a-i-n . . .

That's one of the torturing tests that U. S. Royal Cords and Cables must survive in our laboratories. While undergoing relentless stretching, lengths are scientifically examined and tested at each successive stage.

The purpose? Well, because U. S. Royal Cords and Cables are subjected to punishing tests of stretch, heat, cold, impact, immersion and compression you are assured they are Safety-Tested. They're the cords and cables to meet *all* the demands of your toughest jobs.

THE NEW U. S. ROYAL *Safety Tested*

MINING MACHINE AND LOCOMOTIVE CABLES

UNITED STATES RUBBER COMPANY

1230 SIXTH AVENUE · ROCKEFELLER CENTER · NEW YORK 20, N. Y.

SERVING THROUGH SCIENCE WITH ELECTRICAL CORDS AND CABLES

Coal Mining News
KENNAMETAL UNDERCUTTER BITS CUT 35 PLACES (before regrinding) WHERE OTHER BITS AVERAGED ONLY 1
KENNAMETAL

35 places cut between resharpenings through coal having clay veins—that's the average performance of Kennametal Bits in just one Pennsylvania coal mine. Furthermore, in nearby areas, where the face is clean, Kennametal Bits are cutting up to 250 places between resharpenings!

Before Kennametal Bits were used, operations in the mine had been seriously delayed because the previously used bits could cut, on the average, only one place, and then would have to be removed from the chain.

Why do Kennametal Bits make cutting-in operations practicable where previously the cost was prohibitive? Why do they retain their edge, and cut far more footage?

Because the cutting edge is Kennametal—the tough, durable tool material that is exceptionally hard (75 Rockwell C compared to 66 for hardest tool steels).

What do Kennametal Bits cost?

Their first cost is higher than that of other bits, but their ultimate cost is insignificant, taking into consideration the economies effected through their use.

Want to increase the productivity of your mining machines, and their crews?

Test Kennametal Bits under your operating conditions—and compare results. A note from you brings catalog particulars and prices, or our mining engineer—whichever you say.

KENNAMETAL

SUPERIOR CEMENTED CARBIDES

TRADE MARK REG. U. S. PAT. OFF.

KENNAMETAL *Inc.*, LATROBE, PA.

CHAINS FOR WHICH KENNAMETAL UNDERCUTTER BITS ARE DESIGNED

U1	U2	U3	U4
Short or Longwall Machines	Number 50, 52, 54 Chains	Mtd. Track or Rubber-Tired Gage	Mtd. Track or Rubber-Tired Gage
Cincinnati	.....	Cincinnati	Cincinnati
Goodman	Goodman	Goodman	Goodman
Jeffrey	.....	Jeffrey	Jeffrey
Prox	.....	Prox	Prox
Sullivan	.....	Sullivan	Sullivan
Tracy	.....	Tracy	Tracy

Also Available

Six sizes of two-way Kennametal-tipped drill bits—1⅜", 1¾", 2⅛", 2½", and 3"—to increase production rates and reduce costs of mechanical drilling operations. Solid-center, double-spiral augers that minimize whip, and make fullest use of the advantages inherent in Kennametal-tipped Drills, are made by us for use with all six sizes of bits.

LINK-BELT ELEVATORS and CONVEYORS

APRON • BELT • BUCKET • SCREW AND FLIGHT TYPES

MOVE MATERIALS IN MODERN MAGNESIUM PLANT

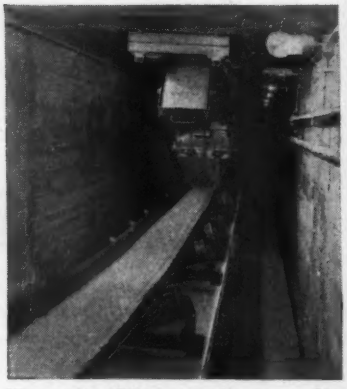
IN these days, industry's production is figuratively on wings as products for war and civilian use pour out. So it is at the New England Lime Company's Canaan, Connecticut plant with a capacity of 15 tons of magnesium metal daily.

It is significant that, in keeping up a flow of raw materials through the crushing, calcining, and mixing stages, up to the briquetting machines, LINK-BELT Elevators and Conveyors are used throughout.

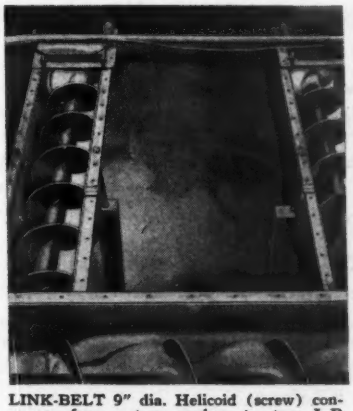
The pictures show a few of the installations. There are many others.

In your planning for tomorrow, consult Link-Belt on materials handling, preparation and power transmission machinery, to help increase production efficiency, improve quality, reduce costs. Write today!

LINK-BELT #778 continuous steel bucket elevator, 48' centers handling dolomitic limestone from gyratory crusher to screen at 80 T. P. H. Extra chute to elevator extends from a hammermill located under screen.



View under 1500-ton capacity storage bin showing minus #6 mesh dolomitic limestone being reclaimed to LINK-BELT 16" wide, 100' long belt conveyor, capacity 15 T. P. H.



LINK-BELT 9" dia. Helicoid (screw) conveyors from rotary coolers to two L-B bucket elevators, handling calcined lime. Two bottom conveyors are each 70 ft. long.

LINK-BELT 4' centers steel apron feeder under R. R. track hopper delivering coal to LINK-BELT 24" wide, belt conveyor feeding ring crusher. Capacity 25 T. P. H.

Hardenbergh Photos.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8. Offices in principal cities.

9041

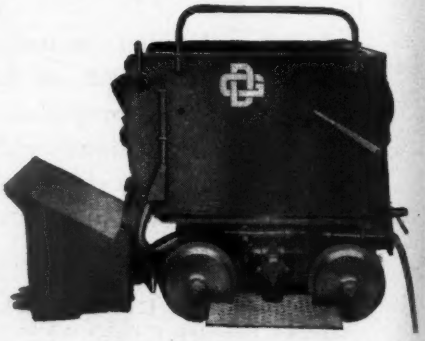
MATERIALS HANDLING AND CONVEYOR EQUIPMENT

Engineered, Built and Backed by LINK-BELT

BIGGER mouthfuls of muck—faster clean-up of muck piles—are two big reasons why Gardner-Denver mine car loaders are preferred by economy-minded users. Here is a loader that's *engineered* to do a better job . . . that proves its case with performance, not claims. You'll want a Gardner-Denver Mine Car Loader because:

- **PLENTY OF POWER—Two 5-cylinder radial air motors—one powers the dipper for a big bite, while the other provides traction.**
- **PLENTY OF CROWD—Both motors function in the crowding action—a result of the famous Gardner-Denver fulcrum principle that puts the force where it is needed for a full dipper.**
- **PLENTY OF LIFTING SPEED—The speed of the dipper increases as it nears discharge position. Discharge is fast and clean.**
- **PLENTY OF ECONOMY—The Gardner-Denver Loader uses no more air than a drifting drill—stands up under tougher service—stays underground where it belongs.**
- **PLENTY OF SAFETY—All G-D 9 Loaders have a low center of gravity—less danger to operator from loader tipping or falling off track.**

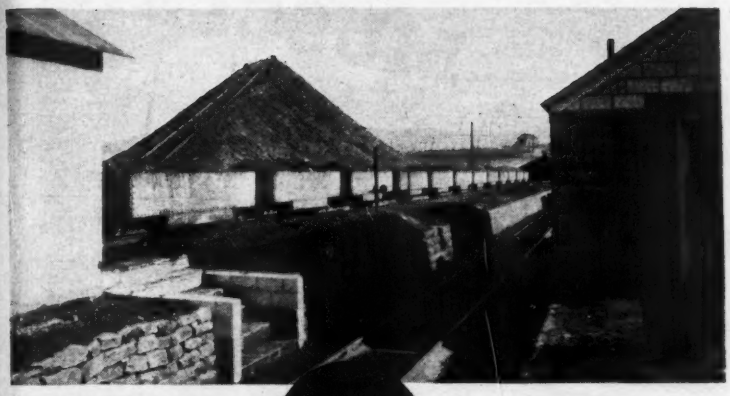
Advance *your* headings faster with the G-D 9 Loader! For full information, write Gardner-Denver Company, Quincy, Illinois.

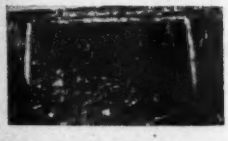


GARDNER-DENVER Mine Car Loader

GARDNER-DENVER

Since 1859





AMERICAN
CYANAMID & CHEMICAL CORPORATION
EXPLOSIVES

Speed your coal preparation

The transportation and handling of coal in the preparation plant may cause "bottlenecks" which handicap production. More often it is some unsuspected factor . . . such as the use of an incorrect explosive in face preparation. Therefore . . .

Select explosives proved by years of service . . .

AMERICAN permissibles and electric blasting caps, products of intensive research, chemical control, thorough inspection and unremitting care in manufacture have proved their merit through years of satisfactory service in representative coal mines.

- ★ **HIGH EXPLOSIVES**
- ★ **PERMISSIBLES**
- ★ **BLASTING POWDER**
- ★ **BLASTING ACCESSORIES**

• *Capable field engineers are available at your call.*

American Cyanamid & Chemical Corporation

A Unit of American Cyanamid Company

30 ROCKEFELLER PLAZA • NEW YORK, N. Y.

EXPLOSIVES DEPARTMENT

SALES OFFICES: Pittsburgh, Pa. Bluefield, West Va. Scranton, Pa. St. Louis, Mo. Chicago, Ill. Pottsville, Pa. Hazleton, Pa. Maynard, Mass.

ALL MUSCLE . . .

and the Power is INTERNATIONAL

• Takes a tractor with plenty of stamina to dig out the pay of a strip mine and toss it eight feet up into dump wagons!

The TD-9 Diesel TracTracTor—International's easy-starting, medium-size crawler with the "fuel miser" engine—is the one to do it. Equipped with this ¾-yard Dozer Shovel it becomes an *all-muscle* combination that can dig, lift and carry—day and night 'round the clock.

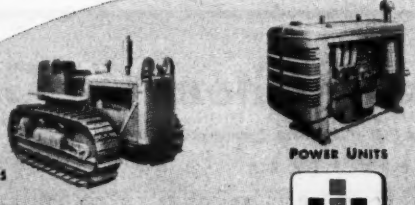
Use it to help remove overburden, to move culm and tailings, to clean up in pits or yards and for other heavy shoveling jobs.

Any International Industrial Power Distributor can give you all the facts about the *full* line of Diesel TracTracTors and available equipment to use with them. He'll gladly help select the right power and equipment for your requirements.

Industrial Power Division

INTERNATIONAL HARVESTER COMPANY

180 North Michigan Avenue **Chicago 1, Illinois**



TRACTRACTORS POWER UNITS WHEELED TRACTORS

INTERNATIONAL

Power for Victory

Industrial Power

Power for Peace

638,257,000

net tons of Bituminous Coal were consumed in the United States during the past year.

This huge tonnage includes coal used by Electric Power Utilities, Byproduct and Beehive Coke Ovens, Steel and Rolling Mills, Coal Gas Retorts, Cement Mills, Industrial Plants, Railroads and Retail Coal Dealer deliveries.

JEFFREY is proud of its share of responsibility in this production. Hundreds of mines are using Jeffrey cutters, drills, loaders, locomotives, mine conveyors, and allied equipment and Jeffrey replacement parts. The Jeffrey line includes a wide range of mining machinery for operation below or above ground. Jeffrey service includes engineering help to assist you in selecting the correct equipment for your particular operating condition.

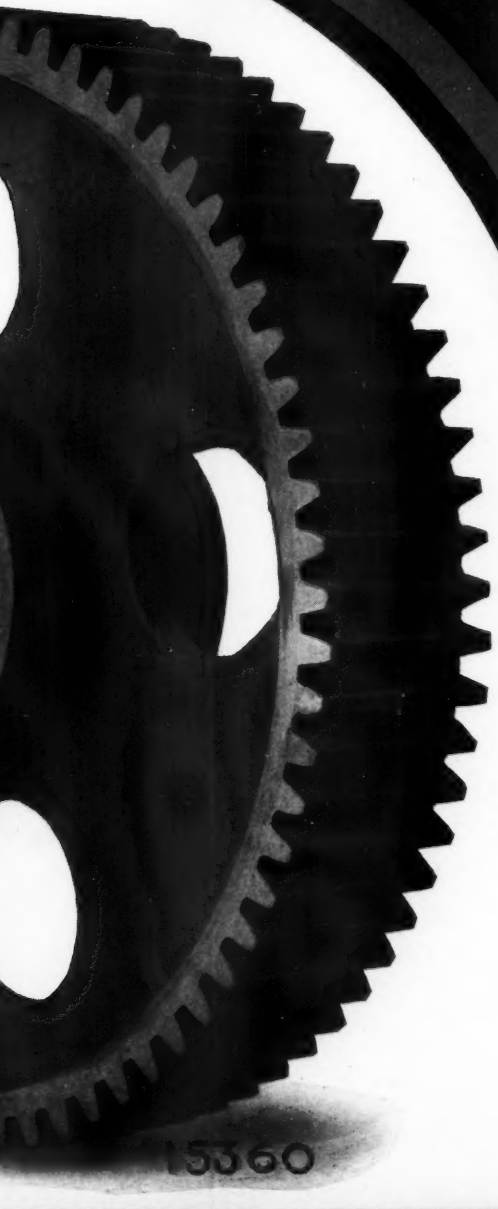
FOR LONGER,
BETTER
SERVICE
AND PERFECT FIT

Jeffre

JM

...ey GENUINE RENEWAL PARTS

Genuine Jeffrey renewal parts offer many plus values as a result of . . . DISCRIMINATING SELECTION OF MATERIAL . . . PROPER HEAT TREATMENT . . . PRECISION MANUFACTURE . . . CAREFUL INSPECTION . . . to insure proper fit. These points are your guarantee of quality parts backed by experience accumulated through sixty odd years in the manufacture of mining machinery and parts.



Jeffrey *Genuine* RENEWAL PARTS

JEFFREY SERVICE TO THE COAL MINES MEANS SERVICE TO ALL INDUSTRY

JEFFREY EQUIPMENT FOR COAL MINES

- BLOWERS
- CONVEYORS
- CRUSHERS
- CUTTERS
- DRILLS
- FANS
- JIGS
- LOADERS
- LOCOMOTIVES
- SCREENS

THE JEFFREY MANUFACTURING COMPANY

Established in 1877

912-99 NORTH FOURTH STREET, COLUMBUS 16, OHIO

Sales Offices: Baltimore, Birmingham, Boston, Buffalo, Chicago, Cleveland, Cincinnati, Detroit, Denver, Harlan, Houston, Huntington, Milwaukee, New York, Philadelphia, Pittsburgh, Scranton, St. Louis, Salt Lake City

Service Stations: Pittsburgh, Harlan, Ky., Birmingham, St. Louis, Logan-Beckley, W. Va., Scranton

Foreign Plants: Jeffrey Mfg. Co., Ltd., Montreal, Quebec; British Jeffrey-Diamond, Ltd., Wakefield, England; Jeffrey-Galion (Pty), Ltd., Johannesburg, S. A.

TO MILLIONS and MILLIONS of AMERICANS...

THE Bituminous Coal Institute carries on the only organized activity continuously to inform the public of the importance of coal as a basic commodity and of coal's advantages over substitute fuels, to correct misimpressions about mining and miners, and to build increased stature and respect for the Bituminous Coal Industry.

Outstanding among the Institute's activities is its comprehensive publicity program. Working hand in hand with paid advertising, it reaches the public through newspapers, magazines, radio, movies, schools, and special exhibits.

For example, in the past year, 24 different constructive, informative stories about coal were placed in 1,256 newspapers. Other favorable, truthful articles were placed before almost 17,000,000 readers of Time, Collier's, and other national magazines. An estimated audience of nearly 5,000,000 was reached by radio. The added support won from movies, informative exhibits and books added many more millions to the potential aggregate audience for this publicity campaign!

The purpose of the Institute is to keep right on informing more and more people, more and more often, of the facts about coal and the coal industry. If you are not already among the progressive, forward-looking operators who are making this constructive program possible, write to the address below for additional information.

BITUMINOUS COAL INSTITUTE

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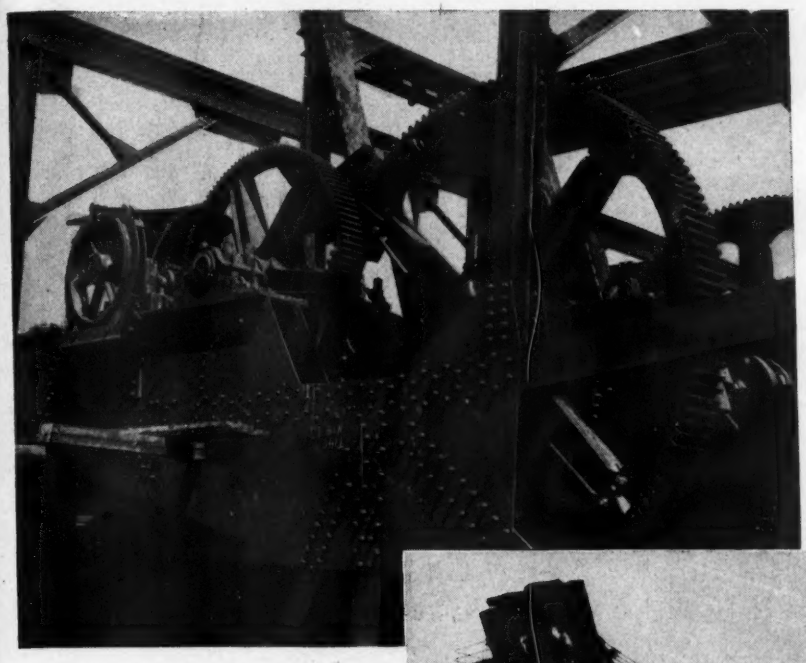

Above: Typical Main Drive, YUBA Placer Mining Dredge.

Below: CALIFORNIA Type Dredge (YUBA No. 139) for Hard Digging.

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Mining
CONGRESS JOURNAL

Published for the Entire Mining Industry by The American Mining Congress
S. A. TRENGOVE, Editor
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"For a Solvent America"

EARLIEST possible congressional action is expected on the tax reduction bill now formulating in the House Ways and Means Committee. Meeting on September 26 for the first time in many years to consider legislation reducing—not raising—taxes, the committee seeks to have the necessary measures on the statute books by November 1 in order to clear the way for 1946 reductions.

Secretary of the Treasury Vinson appeared before the committee (closed to public hearings to speed things up) on October 1 with his "modest" four-point program: (1) Repeal the 95 percent excise tax on corporations at the close of 1945, thus removing an obstacle to business expansion at a time when it is necessary to provide a high level of employment and income; (2) Repeal the 3 percent normal tax and free over 12 million small taxpayers from income tax burdens; (3) Reduce war-time excise taxes to 1942 levels beginning July 1, 1946; (4) Freeze social security rates at 1 percent until Congress can review the situation. His proposal cuts $5-billion from tax rolls.

Business and industry organizations, interested in conditions that will make possible maximum production and employment, have submitted further specific suggestions as to the form tax revision should take. The views of the American Mining Congress, as conveyed to the Ways and Means Committee, are set forth on page 54.

But beyond the immediate amendments in prospect, a general revision of the revenue laws should be undertaken as soon as possible. A valuable contribution to thought on this subject has been submitted to Congress and the Treasury by Roswell Magill's Committee on Post-War Tax Policy. Its 278-page report, "A Tax Program for a Solvent America" points to the ultimate need for a far more thorough revision of our tax structure than is contemplated in the present "transitional" bill.

It warns moreover that the extent of reduction to be expected depends upon how much and how soon Federal spending is reduced, ". . . if a policy of free spending is followed, very few choices among taxes will be possible. . . . Expenditures are the key, and irresponsible fiscal policies . . . would prove not merely costly but unsupportable."

Such declarations ring true and deserve fullest support from those whose fears for the National credit have grown large with ever mounting Government expenditures. The full recommendations of the Magill report may not be adopted. But its strong stand in favor of balancing the budget, eliminating deficit financing and paring down the national debt at the earliest possible date gives us a reasonable formula, "for a solvent America."

Responsibility for Progress

RESTRAINT upon the full development of the coal industry is recognized in a number of disturbing circumstances. Prominent in the picture are such obstacles as labor unrest, unionization of supervisors, lowered mine efficiency and the competition of rival sources of energy.

What the industry can do about it has long been a matter for serious concern and although some progress has been made there is yet much to be done.

If coal is to lower the differential in labor requirements per unit of product, now strongly favoring its competition, it must seek endlessly for improved manpower efficiency. This calls for constant advances in machinery and equipment and closer mutuality of purpose on the part of labor and management. Complete understanding and agreement upon the "rights" *and duties* of both employer and employe are essential. The current move to group supervisors as a collective bargaining unit ignores the traditional and vitally important responsibility of the foreman in the coal industry. There *he must be a leader*—a leader definitely committed to point the way toward safe and efficient mining. Only in this manner can he add force to the progress of his own industry.

Research programs now under way or completed will remove much current resistance to coal use. Coal must match competitors in cleanliness and ease of handling while retaining its natural advantages of cheapness, well established dependability and the generation of sustained uniform heat. Equipment to do all this will be available, we trust, in sufficient quantity to meet the coming building boom. Further research should widen coal use in the railroad locomotive field as well as in other extensive outlets. By-product plants at the mines offer interesting opportunities.

It is evident that coal *can* plan for a great future—and with confidence. But fullest development can only be attained if and when all elements responsible for that future sense the part that each must play and the cooperation each must give.

25 Years Progress in Coal Mining

Further Review of Past Events Reveals a Long List of Interesting and Important Mile Posts Along the Way

The Rocky Mountain Area

★ ★ ★

By O. G. SHARRER
Engineer
Union Pacific Coal Company

★ ★ ★

COAL mining was one of the earliest forms of mining in the Rocky Mountain area following closely on the heels of early gold and silver operations and constituting a very important part of the railroad building which started with the laying of the Union Pacific and continuing through the late 90's into the first years of the present century.

As each new railroad was built into the virgin territory, coal became a vital necessity for the operation of locomotives and furnishing heat to the new communities which were built up along the railroads. In many instances, contractors, who had built the railroad grades, went into the business of mining coal when their original contracts were completed, and the early mine labor was recruited from the ranks of construction men who, while they knew very little of coal mining, were very energetic and aggressive and were able to get the mines on a productive base quickly. As the industry became established, miners from the older eastern fields started to move in, and about the same time, many miners from the British Isles and Continental Europe came west and got employment in the rapidly expanding mining communities.

Pioneers Came from Europe and Eastern States

Early day mine officials came from the group of men who had received their training and experience in the older fields of Pennsylvania, Illinois and other eastern states, as well as in coal mines of England, France, Belgium and Germany.

These men were all of the adventurous type not bound by old traditions and willing to try new methods and ideas. Coal mining in the Rocky Mountain area owes these pioneers a great deal for they developed many of the systems of mining that have proven successful throughout the years.

They never hesitated to try a machine or system that might increase tonnage or reduce cost.

We usually think of mechanization of coal mines as having taken place in very recent times, but, if we study the history of mining, we find that the machine has been a part of the operation from its very beginning.

The steam pump, with the steam

Old style pick mining at Superior C-Mine

Timbering along the pan line at Superior C-Mine under bad roof conditions

winding engine and steam-driven fan, which represent some of the very first application of steam power to industry, made the "Industrial Revolution" of the 19th century possible.

Changes On a Par With Rest of Country

The mines of the Rocky Mountain area were about on a par with the rest of the country in 1900. Individual mines were loading large daily and yearly tonnages by what was then considered very up-to-date methods.

Haulage was done entirely by ropes and animal power, and all coal was hand-loaded with a small tonnage being undercut by air punchers or some of the early forms of chain undercutters.

As the existing mines became older and haulage distances increased, animal haulage was unable to carry the burden, and the use of electric locomotives became quite common.

Electric power for haulage locomotives and undercutting machines made the building of more efficient power plants necessary so that during the period from 1908 to 1918, most of the mines were electrified and hauling by electric locomotives and undercutting by chain undercutters became almost universal practice.

After the period of high prices engendered by World War I, wages in the Rocky Mountain area did not fall and costs were out of line for the existing markets. This caused forward-looking mine operators to look for some means of reducing costs if they intended to stay in business.

Since the largest item of labor cost was the actual loading of the coal into the pit car, it was only natural to seek a machine that would do this work. Such machines had been used in an experimental way for many years, but the need for them had never been acute.

Miners objected to their use fearing that their jobs would be lost, and management never gave them much consideration as long as they could adjust their costs to such market conditions by small changes in the wage scale. Until a firm foundation of electric power had been built up for haulage and undercutting, there was no power available to operate these machines.

After the Jacksonville Agreement of 1922, it became evident that coal mining costs would have to be reduced by increased efficiency if the mines were to be kept in operation. Circumstances and the march of progress in other industries made management realize that the operation of loading coal could be mechanized and search was started for equipment to do the work. Many false starts were made and things that we now know were foolish were tried, but, after a short period of confusion and difficulty, several types of machines and methods of application began to prove their worth. Machinery manufacturers woke up to the potentialities of this market and turned their trained engineers loose on the design and improvement of all types of mine machinery.

It would require too much space to attempt to describe all the machines that were tried with varying degrees of success; therefore, only those that have proven successful are considered.

Rock Springs No. 8 Mine. McCarty Duckbill, operating lever in locked position, ready to advance into loose coal

Rock Springs No. 8 Mine. Longwall face as left by Goodman scraper. No shoveling was done to clean the 248-foot long face

Types of Loading Machines

Power shovels were the first machines used to load coal in pit cars. One of these units was put into operation at the Hanna No. 4 Mine in January, 1916, and these machines did very good work; four machines being kept in operation until they were displaced by mobile loaders in 1930.

These shovels were also used very successfully in the mines of Utah where thick coal and good roof conditions made their operation possible.

The power shovel of ½ and ¾ cu. yd. capacity required 16 ft. minimum head room and could be used only where the coal was unusually thick and the roof could be held with very few timbers.

A crew of eight men could load from 160 to 200 tons in eight hours, but since the shovels had to be dismantled while being moved from room to room the over-all manshift production did not exceed 12 tons.

The application of power shovels did little or nothing to solve the mechanical loading problem, but they did show the great possibilities of machine application and helped to

make all persons concerned more "machine-minded."

When it was decided to mechanize the loading operation, there were available several experimental machines all of which had some merit and many weaknesses.

Mobile loaders could load high tonnages, but could not be used in close timbering or on heavy pitches.

Scrapers were developed to load very efficiently, but they required a drastic modification of the mining system with excessive development. This development required that some form of machine be used if it could be driven fast enough.

Beginnings of the Shaking Conveyor

Shaking chutes or conveyors had been in use in the mines of Europe for a period of years to transport coal from the working face to haulage roads. They were considered as a transportation unit, and no thought had been given to their possibilities as a loading machine.

They had been introduced into the Pennsylvania anthracite region to convey coal on light pitches where chutes were impractical and had proven quite useful in this capacity.

In 1925, several shaker units were purchased and installed in the Rock Springs field of Wyoming.

They were first used as a transportation unit and several attempts were made to develop a long face and fill out the coal by hand shoveling. The long face could not be controlled, and men did not take kindly to the job of shoveling for an entire shift.

About this time, George Ehrensharger, an ingenious machinist, conceived the idea of putting a mechanism on the front of the conveyor that would be self-loading.

He and Frank McCarty, Mine Superintendent at Rock Springs, devised the "McCarty Duckbill," which fed the shovel head into the coal by a ratchet motion. This proved to be quite practical, and several machines were equipped with this device at once.

After this machine had been in service a short while, it was found the shovel could be advanced and retracted by means of grip blocks and that the ratchet wheel was not necessary. Mr. Ehrensbarger perfected a machine using the grip blocks, and the Duckbill became a very practical loading unit.

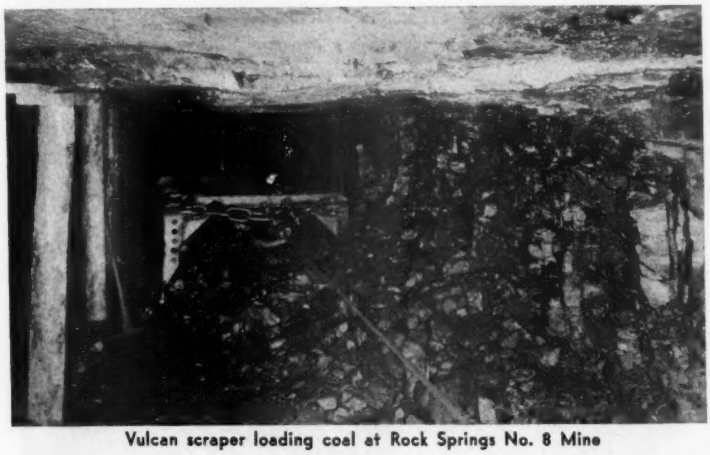
Many Advantages Obtained

No basic changes in the mining plan were required when the shaker and Duckbill were introduced for the shaker will work successfully in any standard room and pillar system. This was a very important advantage at the start for many mechanical loaders failed through requiring too drastic changes in the mining plan.

The ability of the shaker and Duckbill to drive entries rapidly made it possible to work the mines on a retreat system, and this item alone has resulted in a large reduction of mining cost through reduced charges for maintenance of haulage roads and airways. Ventilation and haulage are simplified which leads to increased safety.

Increased flexibility of output has come from the plan of working a majority of the loading units on entry development in periods of slack demand and returning them to wide rooms when large tonnages are needed.

The introduction of mechanical loaders gave a new impetus to thought on all kinds of machines in use in coal mines, and the last 25 years has seen great improvements in haulage locomotives, undercutting machines, hand drills, pumps, etc., as well as the introduction of several completely new developments, such as the shuttle car, high capacity belt conveyor and other devices too numerous to cover in an article of this kind.



Vulcan scraper loading coal at Rock Springs No. 8 Mine

What Future Progress May Show

A discussion of possible future progress in mine mechanization can be divided into three closely related subjects which might be called machines, men and mines.

Loading machines and equipment in general:

The mobile loader has been developed to suit almost every mining condition and will load coal so rapidly that no present system of haulage can keep it busy more than 50 percent of the time. It would appear that the improvement of this type of machine for the immediate future should consist of better steels with less weight, simplification of design and improvement of controls. Also, more thought should be given to designs that will give the operator protection from close ribs and timbering during the loading and tramming operations.

There remains also the problem of operating these machines on the heavy pitches found in the Rocky Mountain area for, while much coal has been loaded on pitches as steep as 19 degrees, there is considerable hazard and loss of efficiency when mobile loaders are used either up or down a pitch which exceeds seven degrees.

Scrapers have passed out of the picture in the Rocky Mountain area due to difficulties encountered in controlling roof and providing sufficient development. Up to this time, however, no mechanical loading unit has produced the phenomenal daily tonnages that was obtained by some of the large scraper units.

There are many millions of tons of coal in seams 4 ft. and less in height which will have to be mined at some future date, and the light two-drum hoist and medium-sized box scraper has proven its worth on this type of operation. Where roof and floor conditions will permit, we can expect the medium-sized scraper with some form of long face to be used in the future mining of low seams.

Shaking Conveyor Most Popular

The shaking conveyor, equipped with the Duckbill, is the most popular form of loading machine now being used in the Rocky Mountain area.

The shaker has earned this position by its ability to work under roof requiring heavy timbering and to load successfully on the heavy pitches encountered in the various mining districts.

Maintenance of this type of machine is quite low, which is another attractive feature.

This machine has been much im-

proved since the first crude models were imported from Europe, but future research and experiment will, no doubt, uncover many ways of increasing its efficiency.

The pan shape was devised in Germany and is not easily handled or particularly efficient when its weight and cross section is considered.

Someone will eventually devise a better pan fastening than the one now in use.

The swivel is a rather crude mechanism and has not been improved much since the first model was assembled.

The latest type Duckbill is much better than the first models, but it will, no doubt, be made more flexible and easier handled as time goes on.

A form of bell crank is standard equipment for right-angle loading with conveyors in Europe, but this device was discarded early in the experimental period here on account of difficulties encountered in anchoring it in place. A right-angle trough has been developed which works quite well, but is very heavy and hard to move.

Now that more is known about pan line behavior and general conveyor maintenance, it may be possible that a new device can be designed that would incorporate the better features of both the bell crank and the right-angle trough. Such a device would greatly improve the efficiency of driving entry crosscuts and recovering pillars.

Workers and Mechanization

Workmen in every occupation have always feared the machine. This fear stemmed from the very natural apprehension that machinery would displace them with the result that they would lose their livelihood. This fear was not in any way groundless for the history of our "Industrial Revolution" has afforded too many examples of the introduction of machinery causing wide-spread unemployment among the workmen of that particular industry.

Every machine from the locomotive and undercutter to the loading machine met with considerable opposition from the miners. Sometimes this resistance was passive and merely took the form of ridicule and refusal to work on the new machine, but too often the opposition was of the violent form and caused very bitter strikes with all their accompanying evils.

The introduction of mechanical undercutters had, in a sense, broken the ice for the introduction of machinery, but the first loading machines introduced in the Rocky Mountain area were viewed with considerable suspicion and, in some cases, open hostility. Forward-looking operating men, who understood this attitude of mind, adopted the policy that machines would not be allowed to displace miners, but would be installed only to offset the natural depletion of forces through death, retirement and separations.

This comparatively simple policy, more than any other thing, made the introduction of loading machines a success.

While most of the older miners did not like the system of working in crews under close supervision, the younger men liked the crew setup and the more interesting work.

With proper planning, it has been possible to find suitable work for the older men on jobs for which they have been trained.

Timbering, track laying, and general maintenance jobs remained about as in the hand-loading days so that the "Old Timers" gravitated into these jobs naturally and have made a substantial contribution by passing on their skill and experience.

Workmen Become More "Machine-Minded"

This phase of getting mechanization accepted has been safely passed, and labor has become almost completely "machine-minded" and would not return to the old hand-loading times if it were possible. Many old timers talk of the good old days of contract mining, but object strenuously if asked to load coal over the side of a pit car with a shovel.

In a number of instances, older men have taken to mechanical loading work very well and, with their wide experience and know-how, are able to show exceptional machine-shift and manshift performances.

One outstanding example is in a small completely mechanized mine manned by men whose average age is well over 50 years. These men have been at the top of the performance sheet during the last two years, both in tonnage loaded and safety records.

Mechanization did away with the old "father and son" method of training employes, and something had to be devised to take its place.

Many different plans were tried over a period of years and good results were being obtained as early as 1930. During the early period, new men were introduced in small numbers, and the various foremen had plenty of time to devote to their training.

Training Program Had to be Installed

The labor shortage, which started in 1941 and which has become more acute with each passing month, changed the training program overnight. Men with no mining experience whatever had to be trained as fast as possible and assigned to work that in prewar times would have required two or more years of underground experience.

Lessons learned and methods devised at the start of mechanization were overhauled to cover the new situation and with the help of the Training Within Industry group from the War Manpower Commission, the training program was standardized with excellent results.

This over-all method of training can be carried on in peacetime with beneficial results for both labor and management if the problem is approached in the proper frame of mind.

The field of labor relations is the most important of all phases of future progress in coal mining. No matter how well a mine may be planned and equipped, it cannot be operated successfully if the miners are not satisfied with their working conditions and earnings.

Miners' Welfare Problems

Housing has always been a problem around coal mines and, while much has been done to improve the miner's living conditions during the last 25 years, there are still too many "tobacco roads" around the bituminous mines of the United States. This problem will not be solved overnight for its roots are deep in the past and are tangled through all the problems of human nature and economics.

Much has been written and said about the atrocious living conditions around coal mines, usually by people who have little actual understanding of the matter.

Many miners live under bad conditions through choice, or rather inertia, for they have not been educated to demand such things as bathrooms, hot and cold water, with a place for a lawn and flower garden.

Where a coal mine is being operated at a loss, it is easy to understand why the owner is very reluctant to spend large sums of money on his housing facilities. This problem will have to be attacked with great vigor in the postwar years and can be solved only by mutual effort and cooperation of both management and labor.

Future Mining Systems

At first it was thought that the basic mining plans would have to be changed if mechanical loaders were to be successful, but this has been proven to be largely untrue and the most modern mining plans use the basic principles of operation that have been proven sound over several centuries.

It should not be assumed, however, that we have perfected our methods to a point where nothing further needs to be done for the future will introduce problems which will require a great increase in our scientific knowledge.

The greater portion of our coal is being mined under comparatively light cover, very little tonnage being obtained from depths beyond 1,600 ft. This shallow coal is being exhausted more rapidly than even well-informed persons realize, and the mining of coal from depths of 1,600 to 3,000 ft. will have to be undertaken before the present century closes.

Nature has been very lavish in building coal seams in the Rocky Mountain area and we consider seams to be unminable that are better than the best of other lands.

There are literally billions of tons of coal in seams of 4 ft. and less that will have to be mined as time goes on. Both of these problems will require the use of the best engineering, brains, and scientific research for their solution.

It would appear that some of the well-trained and experienced engineers of the United States Bureau of Mines could be assigned to the study of these and related mining problems, leaving law enforcement and routine inspection to the State Mine Departments.

Progress in Safety

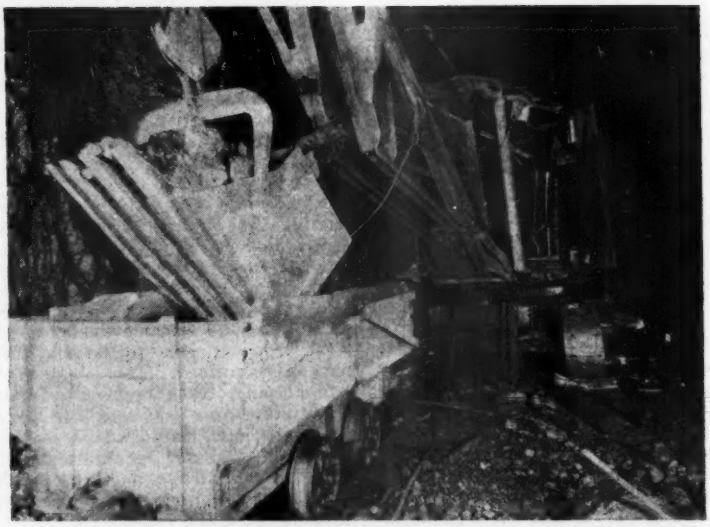
Previous to the year 1910 safety in coal mines was not given any organized attention, and the killing and maiming of men employed in coal mines was considered as one of the inescapable hardships of the industry.

After the organization of the United States Bureau of Mines and the passage of the various state compensation laws, safety work was placed on an organized basis and accident prevention was given scientific study by trained men. Accidents were analyzed as to their cause and rules were formulated to prevent their repetition. Nearly ten years elapsed before any appreciable improvement could be detected, but during this period the Bureau of Mines had built up a force of competent engineers and had learned how to prevent accidents. Safety measures that were developed by these men are now accepted as standard practice at all coal mines, although we must remember that as late as the early 20's there were many sincere mining men who could not be convinced that coal dust would explode unless methane gas was present.

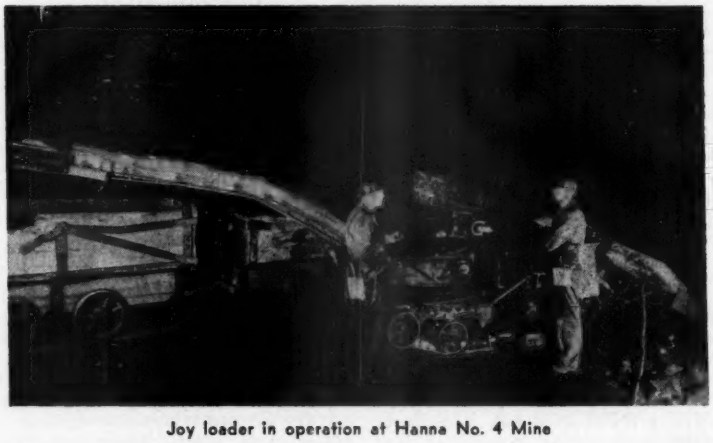
Some of the measures which were initiated by the bureau engineers and have resulted in saving thousands of lives since 1920 may be listed as follows:

The use of rock dust and rock dust barriers have cut the loss of life from major disasters to a very low figure.

Improved ventilation and sealing or ventilating abandoned places have cut the number of gas ignitions each year to such extent that it can be said that this danger can be almost entirely eliminated if the rules are obeyed.



Thew electric shovel delivering coal to car at Hanna No. 4 Mine



Joy loader in operation at Hanna No. 4 Mine

The use of sprinkling water on cutter bars, coal piles, and haulage roads has cut the hazard of dust explosions to a minimum and has gone a long way toward completely eliminating anthracosis and silicosis which were the curse of the early-day coal miner.

The application of standard timbering plans with adequate supervision was a necessity when loading machines were introduced and has resulted in an increase of safety in direct ratio to the efforts expended.

Clearly written books of rules with a set-up of standard methods of working have benefited both safety and efficiency.

Safety Engineers on Supervisory Force

When the first safety engineers appeared around coal mines they were not very well received by the official staff for they thought some of their authority and prestige would be taken away. It took a period of time and much tact for this doubt to clear up, but it has been accomplished and the safety engineer is now an accepted and much-respected member of the coal mine supervisory staff.

It would appear that the most fruitful field of future progress in safety lies in the training and education of the individual miner in better and safer work habits and the extension of standards and rules which express the best thought on how to conduct the operation of mining.

If a man is well trained he will work safely if the subject is mentioned only occasionally, while a poorly-trained man could not work safely if he had a skilled safety man to guard his every move.

Central Pennsylvania

By T. F. McCARTHY

Coal Mining Dept.
N. Y. C. R.R. Co.

NO ATTEMPT will be made in this article to give an exact chronological history of the development of mechanization in the central Pennsylvania field during the 25-year period from 1920 to date as sufficient time was not available to get all the information necessary, but an attempt will be made to follow the general trend in the introduction of various types of mechanical equipment and if there are omissions of the names of companies who pioneered in this work apologies are made in advance.

In 1920 central Pennsylvania produced approximately 59,910,000 tons of coal with 30,691,000 tons or 50.290 percent of this coal undercut with electric shortwall mining machines or air punchers. The balance of this production was produced by hand-mining methods or what is known in this region as "pick coal." As the first World War, which had begun in 1914 and in which we became involved in 1917, had ended in November, 1919, during these years the operator and mining equipment manufacturers had very little time for experimental work.

Scraper Loading Introduced

However, the Carroltown Coal Company, Northwestern Mining & Exchange Company, Penelec Coal Company, and the Hillman Coal & Coke Company had purchased scrapers or entry loaders during the period from December, 1918, to January 1, 1920. It is assumed that this equipment was for experimental use, however, as no further purchases were made. During this same period I understand that a limited number of two-drum stationary type scraper hoists were purchased but their use was very limited.

No records are available as to further purchases of scraper loading equipment until 1924 when the Clearfield Bituminous Coal Corporation purchased a Goodman Type A entry loader in June, 1924. During this same year the Pennsylvania Coal & Coke Corporation began the production of scraper loader coal using two-drum hoists, and have continued the use of this type of loading equipment up until the present time. They have now installed and are using a number of the more modern design made by Sullivan Machinery Company and Ingersol-Rand Company.

This scraper equipment was and is used in the development of entries where the coal is first extracted and the rock is then brushed in the haulage entry for additional height and has proved satisfactory for this combined use. The greater production of scraper coal has been in its use in the so-called V face or the single long face.

The V-System of Mining

The V or long faces are established by driving narrow rooms of from 12 to 15 ft. in width on centers of from 80 to 125 ft. and developing the cross cuts as these rooms are advanced. If the scraper is used for the development of this narrow work the coal is usually loaded by hand into the scoop. When the inby cross cut is driven the V faces are established by diagonal cuts, as shown by dotted lines on the right face of sketch No. 1, until these faces reach an angle of from 30 to 60 degrees to the runway of the rooms. In some instances this V face is established by making the cuts as shown by the dotted lines on the left face of sketch No. 1.

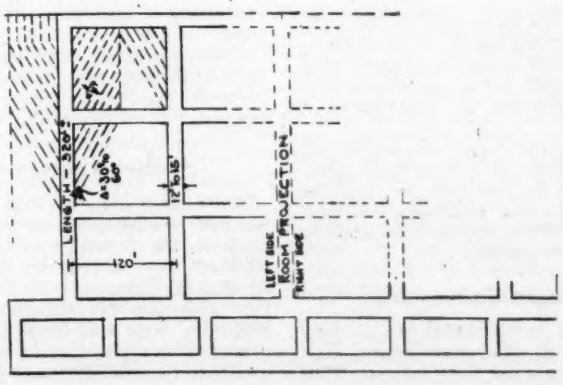
The objection to this system of mining is the time required to drive the runways and develop the V faces. It can be seen, however, that once these faces are established and one face is being prepared as the other is being loaded out, a substantial tonnage can be produced from each room. There are many sections where this method of mining has been tried and has proved unsuccessful because of the nature of the overlaying strata which resulted in frequent caves that closed up the faces requiring that these faces be reestablishd by narrow work development.

Another factor that has prevented the more general use of scraper mining is that most of our seams are underlaid with a soft fire clay and the continued operation of the scoop over the runways will dig up the bottom and contaminate the coal. The operation of an open-bottom scoop loaded with coal also tends to increase degradation of the coal.

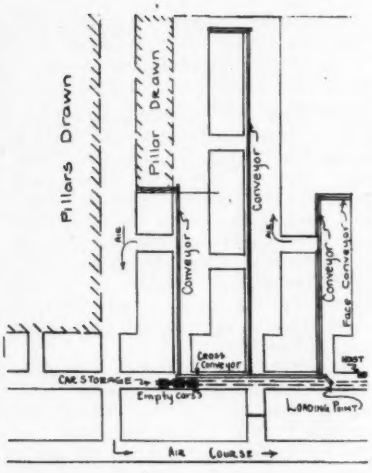
In the early development of this system of mining, in order not to tie up scraper equipment for the small tonnages that could be secured from the narrow development, these places were developed by hand loading into mine cars. More recently this development is being done by the use of a mobile loading machine loading into the scoop.

Scrapers have continued to be used in the district in a limited way for entry development work and have been found to be most useful in loading out rock where brushing is required for height in haulage entries.

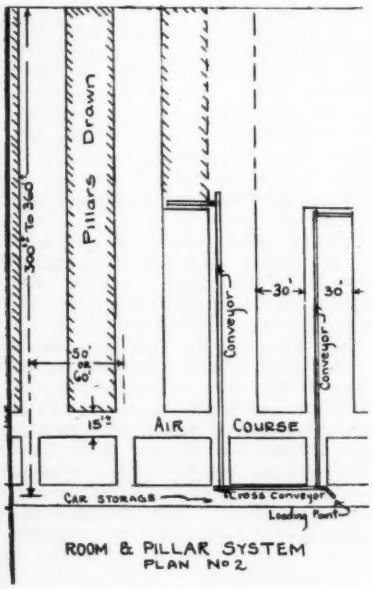
Continued experimentation is going on with this type of equipment and in recent years several methods have been developed to adapt it to the mechanical loading of coal in the advancing rooms as well as the retreating pillar in the room and pillar system of mining. These experimental methods are being used to load this



SKETCH NO 1
"V" SYSTEM OF MINING



ROOM & PILLAR SYSTEM
PLAN No 1



ROOM & PILLAR SYSTEM
PLAN No 2

coal into the mine cars at the entry and also in loading it onto a conveyor at the face to eliminate contamination where a soft bottom is encountered and to minimize the degradation of the coal.

It is the opinion of the writer that the simplicity of the scraper equipment with its low first cost and low maintenance cost justifies a continuation of effort to broaden the application of this equipment.

Chain Conveyors

The first experimental use of chain conveyors in this area began in a limited way some time between 1920 and 1922 and these experiments continued to broaden through different companies installing this equipment. By 1927 substantial tonnages were being produced by a few companies and the use of chain conveyors began to come into more general use. In the years between 1924 and 1929 many types were built until the present design now in most general use was developed. In the early years many mechanical problems and details had to be worked out and much experimenting was necessary to determine the length, size and shape of pans, the most efficient type of pan connectors, types of conveyor chains and flights, the development of the drive units, motors, and controls, and the many auxiliary units such as coal drills, blower fans and tubing. Improvements and refinements in design have continued to be developed.

In general, the use of chain conveyors was applied to existing room and pillar systems where the coal was produced by hand loading into mine cars. And although some modifications as to width of rooms and pillars have been made and some operators have adopted first mining methods and do not mine the room pillars, this type of equipment has proved most successful in applying it to the old well-established conventional room and pillar mining.

The introduction of conveyors involved the training of miners to the use of this equipment and it has required many years to convert miners to these new methods. In particular, this method of mining required that a greater number of men work together as a unit and pool their earnings. We now have many men whose mining experience has been entirely with chain conveyors and this has resulted in satisfactory results to the miner and operator.

In passing, credit is due the Pennsylvania Coal & Coke Corporation, Barnes & Tucker, Reading Coal & Iron, and other companies for their early pioneering work in the introduction and development of this equipment and to E. B. Gellatley, now deceased, for his work in developing and improving the design that has continued in use up to the present time.

Chain conveyors have been applied in conjunction with mobile loading units during recent years and there are now many successful installations.

Shaker Conveyors

My information is that probably the first shaker conveyor installation made in the district was that of an Eickhoff unit in 1921 by the Barnes & Tucker Company of Barnesboro, Pa. This was for experimental use and very little was heard about the use of this type of equipment until a company was formed (Conveyor Sales Company) in 1926 to import and sell it. The Eickhoff Shaker Conveyor was made in Germany and during the years from 1926 to 1928 many German-made shakers of different capacities were sold and installed. In 1928 this company began the manufacturing of shaker conveyors in this country and made improvements in mechanical details. These types as well as types made by other manufacturers in this country during this time had the disadvantage that they did not have sufficient "kick" to move the coal against appreciable grades and their successful use was limited to installations where the grades were in favor of the movement of coal. In 1932 The Goodman Manufacturing Company took over the company and in 1933 had developed a modern unit that could be equipped with a reciprocating action engineered to any condition of grade, capacity co-efficient of friction, wet and dry material, etc., and with mechanical strength to use in connection with the duck-bill or self-loading head that had been developed some years previous in the mines of the Union Pacific Coal Company in Wyoming.

Some of the early users of shaker conveyors in this area were: Graff Brothers, Blairsville, Pa.; Clearfield Bituminous Coal Corporation; Pennsylvania Coal & Coke Company; and many others.

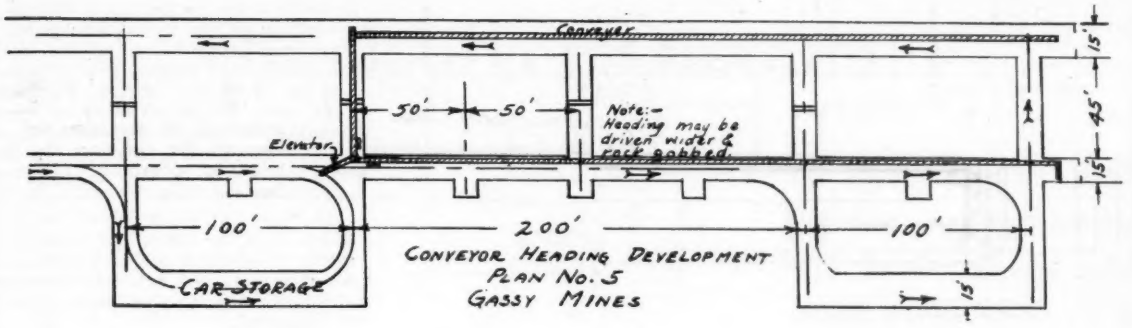
In general the shaker conveyor is used in the room and pillar system of mining. Attempts were made in the early days of shaker conveyors to use a bell crank for driving a face loading pan parallel to the face and for retreating pillars, but they were found to be generally unsatisfactory for this use. There has been developed and in successful use a right angle drive pan that is continuous with main line pan which serves as a face conveyor and for retreating pillars.

A number of successful air-driven shaker conveyor installations were made in this area some years ago, primarily for safety in gaseous mines. They have given satisfactory results although their use has been restricted because of the cost of compressor installation necessary to drive them.

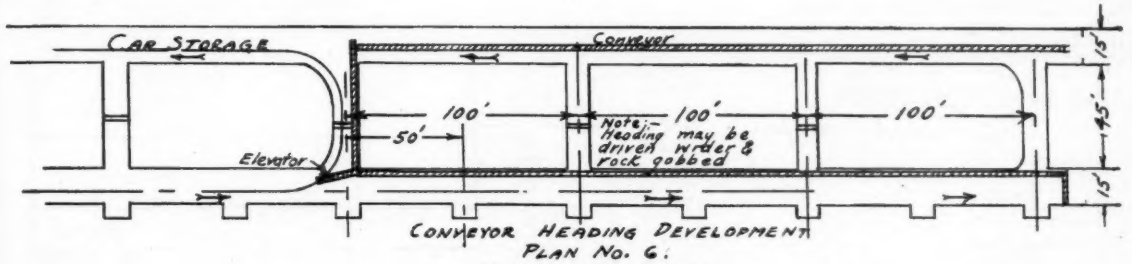
Belt Conveyors

The installation of conveyors in thin seams and the desirability of concentrating large production and eliminating the cost of brushing rock in entries has made desirable the installation of gathering belts. These sectional belts of widths of 26 in. to 30 in. and in length up to 2,200 ft. were first installed in this district about 1931 and the number in use has been increasing very rapidly.

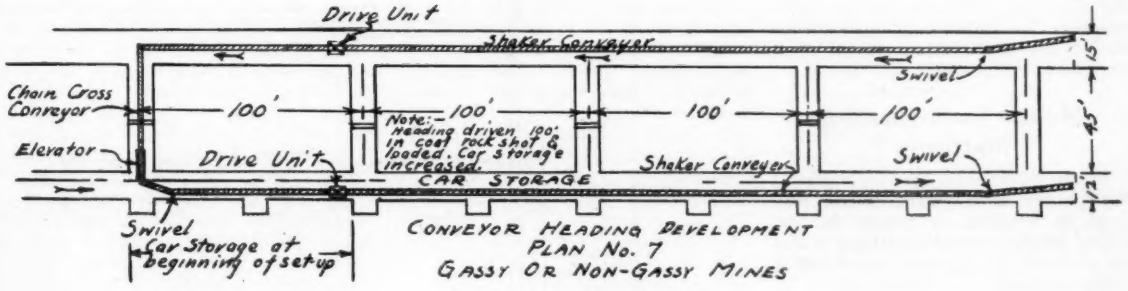
Mining systems in which belts are used are either the room and pillar or the first mining system using an advance retreat or full retreat system. The number of conveyors loading onto a belt vary from three during the development of the entry on advance to a total of eight on full re-



CONVEYOR HEADING DEVELOPMENT
PLAN NO. 5
GASSY MINES



CONVEYOR HEADING DEVELOPMENT
PLAN NO. 6.
NON-GASSY MINES



CONVEYOR HEADING DEVELOPMENT
PLAN NO. 7
GASSY OR NON-GASSY MINES

treat which permits the concentration of large tonnages in a small area.

Experiments were made by the Barnes & Tucker Company with belt face conveyors as early as 1921 and the Pennsylvania Coal & Coke Corporation also used this type of face conveyor about this same time. Because of the fact that it had a fixed length which could not be readily altered it was found generally not applicable to our conditions.

Room belts were also experimented with in our thin seams but were never very successful because of their height above the bottom unless a flat belt was used, but the primary objection was in the difficulty of extending this type of unit as the face advanced.

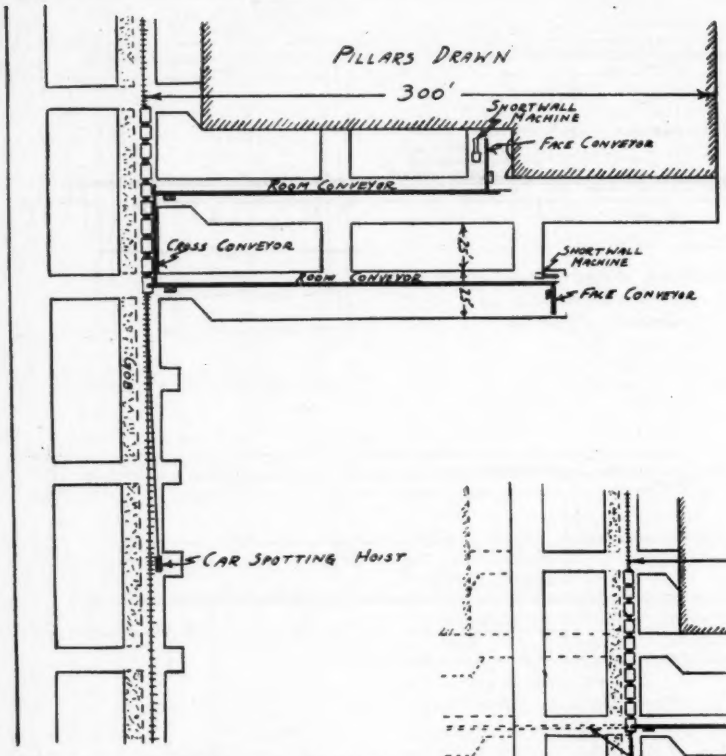
Belt gathering conveyors are now in general use in this area where mobile loading units load onto conveyors and where shuttle cars are used to transfer the coal from the face to the entry.

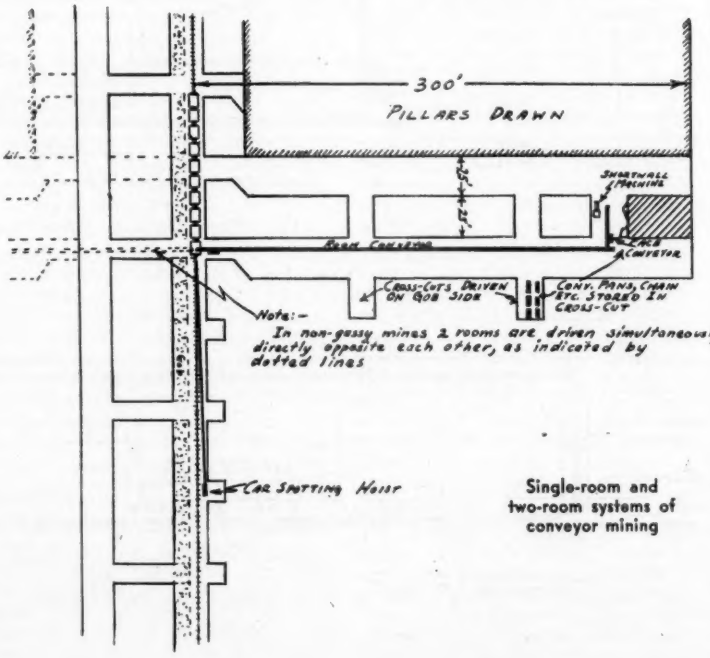
Mechanical Loaders

The first application of mechanical loading of coal in this area was in 1921 when a loading machine was designed and constructed by the Barnes & Tucker Coal Company. This machine was used experimentally up until 1924 when its use was discontinued. The next installation was by the Rochester & Pittsburgh Coal Company in 1925 but mechanical difficulties and lack of a satisfactory way of servicing this loader resulted in its discontinuance. Other installations were made between 1925 and 1936 but the types then being built were too high for the coal seams and their use was discontinued. It was not until 1936 when designs were low enough to suit seam height that progress began with mobile loading machines. Today we have many successful caterpillar and track type mobile loading installations in operation.

Early in the experimental installations of these mobile machines it was found that their success depended on the installations of outside cleaning plants to prepare this coal for commercial use so that as additional cleaning plant installations are made the number of mobile loading units installed increases in number.

All mechanical loading units in-




300'
PILLARS DRAWN
SHORTWALL MACHINE
FACE CONVEYOR
CROSS-CUTS DRIVEN ON ROB SIDE
CONV. PANS, CHAIN ETC. STORED IN CROSS-CUT
Note:-
In non-gassy mines 2 rooms are driven simultaneously directly opposite each other, as indicated by dotted lines
CAR SPOTTING HOIST

Single-room and two-room systems of conveyor mining

stalled up until 1939 were loading into mine cars or onto conveyors. At this time the first shuttle cars were installed in conjunction with mobile loaders and installations of this type have also been steadily increasing.

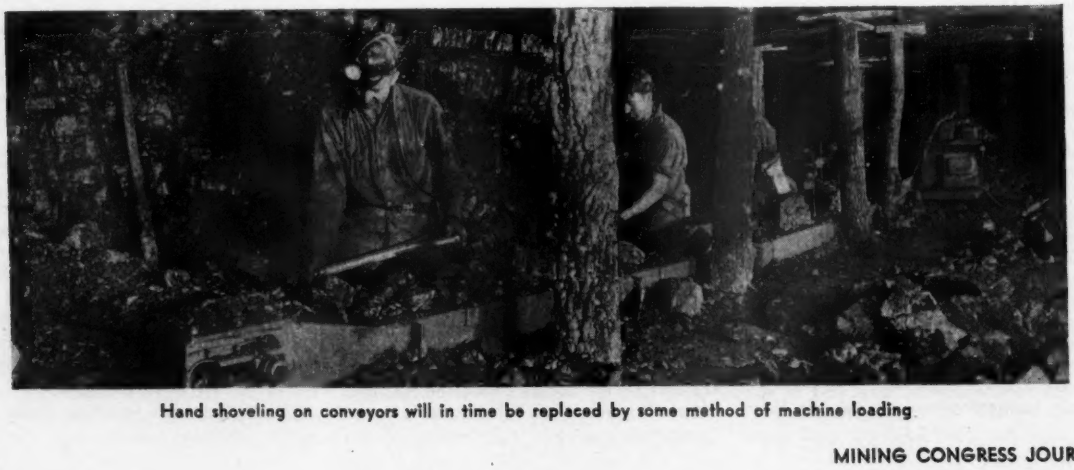
Mobile Rock Loading Machines

In our thin seam the necessity of rapid entry development, where rock must be brushed to secure the required height, has always been a major problem and has been a subject of constant study.

As early as 1923 and 1924 the Penn Run Coal Corporation and the Clearfield Bituminous Coal Corporation and possibly other companies in this section installed the Myers-Whaley loading machines for loading out rock brushed in the entries and in cleaning up caved air courses. In 1925-1926 rock gobbing conveyors were installed in conjunction with these loaders for gobbing the rock in entries to eliminate the necessity of hauling this material to the outside.

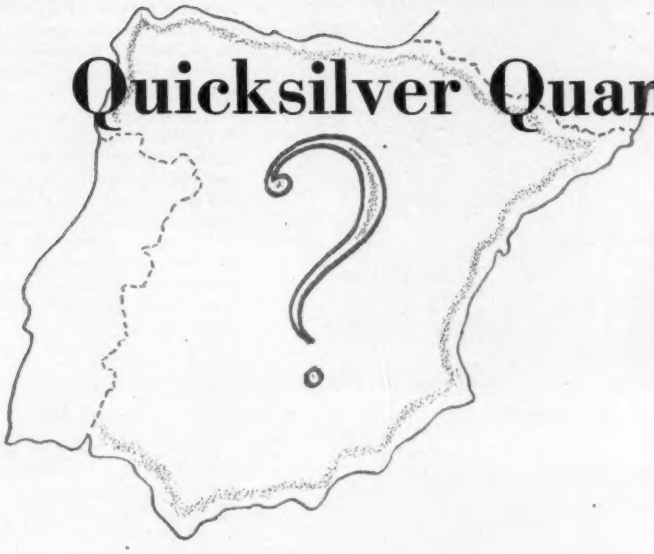
In these particular mines the coal seams were too low to use these machines to load the coal and their use was limited to rock only. As a matter of interest a number of them are still in operation.

In more recent years, where seam height permitted, the improved type of Myers-Whaley Loader has been successfully used in loading both coal and rock.



Hand shoveling on conveyors will in time be replaced by some method of machine loading

Quicksilver Quandary



The American Quicksilver Industry Finds Itself Facing Early and Complete Extinction Through Sudden Flooding of Domestic Markets by Foreign Imports. An Emergency Exists and Must be Attended to Immediately If We are to Retain This Important Military and Economic Asset

By a SPECIAL CONTRIBUTOR

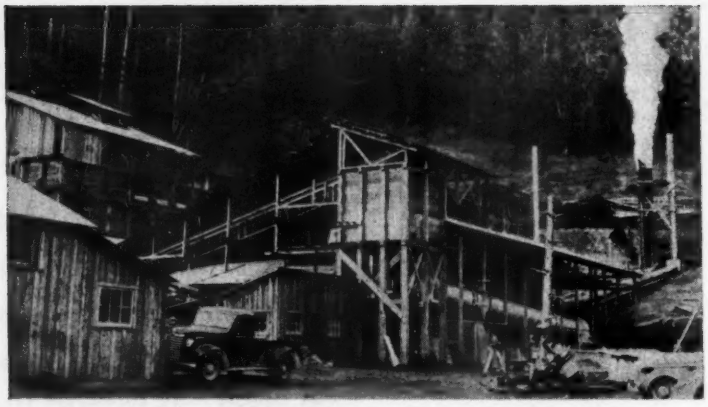
A RECENT State Department release* reveals a Roosevelt declaration of policy last March stating there is, "no place in the community of nations" for the Franco Government of Spain. President Truman has also made it quite clear † that he doesn't like Franco and doesn't like his government. Yet within the period between issuance of these two statements, the United States Government, through the operations of its procurement agencies was indirectly supplying Franco with the necessary dollar exchange to keep his government in office. Tremendous amounts of Spanish quicksilver were being imported during this time. As the result of this importation of foreign metal (produced by labor which in its top brackets earns around $250 a year ‡) domestic producers of mercury have for some time been fighting a losing battle for the domestic market; and when the cancellations of V-J Day came through, almost 40,000 flasks of quicksilver were made available to an unwilling market unable to absorb such a flood of metal. The figures § herewith are brought up to the date of October 1 by producers' estimates and show the situation clearly:

* September 26, 1945.
† Washington Post, August 24, 1945.
‡ Minerals Year Book, 1939.
§ U. S. Bureau of Mines Monthly Mercury Report No. 72.

July production (domestic)	3,600	U. S. Bureau of Mines
July imports	19,354	
July consumption..	6,600	
Stocks as of August 1	35,179	
August production.	3,300	Estimated Figures
August imports ...	4,000	
August consumption	4,200	
Stocks as of September 1	38,279	
September production	1,700	
September imports.	1,000	
September consumption	2,000	
Stocks as of October 1	38,979	

The idle rock drill is symbolic of the Reed mine's chief difficulty

H. W. Gould and Superintendent Wes Shattuck admire New Idria's high grade (the dark portion is largely cinnabar)



Furnace plant at the Bonanza mine, Oregon's largest mercury producer

Persistent is the word for New Almaden. The Santa Rita shaft shown here has been outproduced by new open cuts and old dumps

Thus at the end of September it is estimated that there will be 39,000 flasks of quicksilver apparently available for consumption in the United States. Normal pre-war annual consumption figures ranged from 20,000 to 25,000 flasks a year. Current stocks on hand therefore total about 18 months' supply.

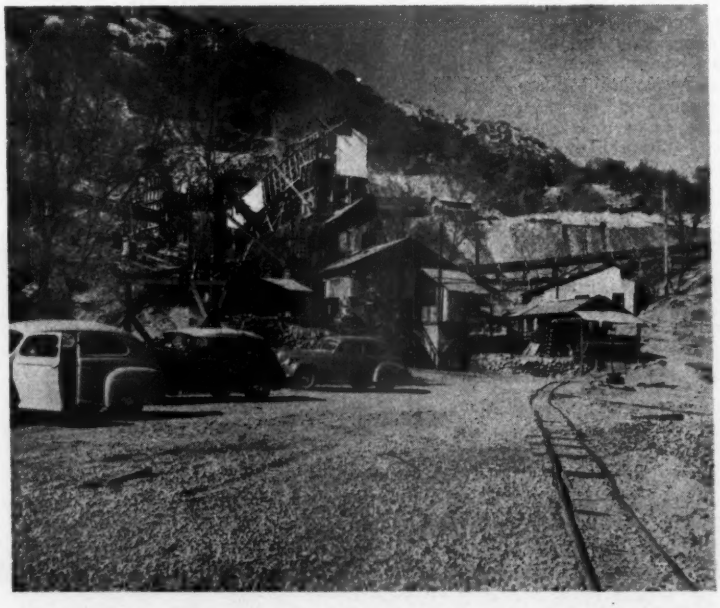
Domestic Industry Coming to a Complete Stop

The domestic quicksilver market has had no buyers and although a nominal price of $90-$95 per flask, spot New York, was being quoted in September, producers had been unable for more than two months to dispose of their production and at the present time are largely closed down or closing down. The pictures of some of these sacrifices to Franco and the Spanish-Italian cartel are shown on these pages.

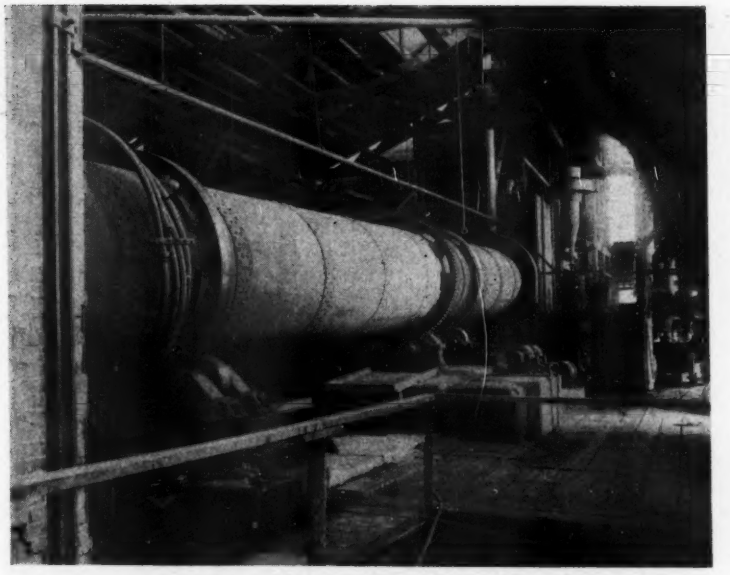
The largest producer has cut production by 50 percent and plans further curtailment. The second and third largest producers are closed. The fourth largest producer is down to one-seventh of his March output. The fifth largest producer is producing half of his May and June capacity. The remaining important producers are undecided at the moment since if they close now they see no possibility of re-opening. Their production capabilities simply cannot take care of a shutdown, yet if they had a market and could keep going, they would represent a considerable source of metal *and jobs* for some time to come. The 15 "little fellows" who survived the government cancellations of January, 1944, now almost universally face extinction.

American Quicksilver Was All-out for War

During the war period the quicksilver industry of the United States and the quicksilver industry of Canada and Mexico performed an almost miraculous feat. In December of 1943, immediately before the government cancellation order first went through, operators in these countries were producing at a rate in excess of 120,000 flasks a year—which, before the war, was a fair average world production figure. Just two years later, however, in December of 1945, it is predicted on the basis of what is now happening that there will be little if any production on the North American Continent. Unless the current surplus of apparently available metal is removed, no domestic or Canadian producer can see hope for operation, and it is extremely doubtful if Mexico can continue to produce without a market. An American industry which



Bradley Mining Company's Mount Diablo mine and quicksilver plant, California



New Idria's modern plant has a 56-foot kiln

gives both the military and economic world an indispensable product (its importance in modern munitions and "bright new world" products is enormous) now faces virtual extinction. Do we dare let this happen?

If the domestic industry should be forced to close and "sweat out" an 18-month wait, probably not more than three producers will be able to reopen and the remaining 17 will pass from the picture for some years to come if not forever. It must be emphasized that this closing is not primarily a price closing, since many of these mines would probably produce at pre-war prices combined with pre-war costs, but with a complete lack of market none can afford to stockpile for the 18-month shutdown indicated. Many could not afford to stockpile even for a two-month period.

European Cartel Precludes Confidence in the Future

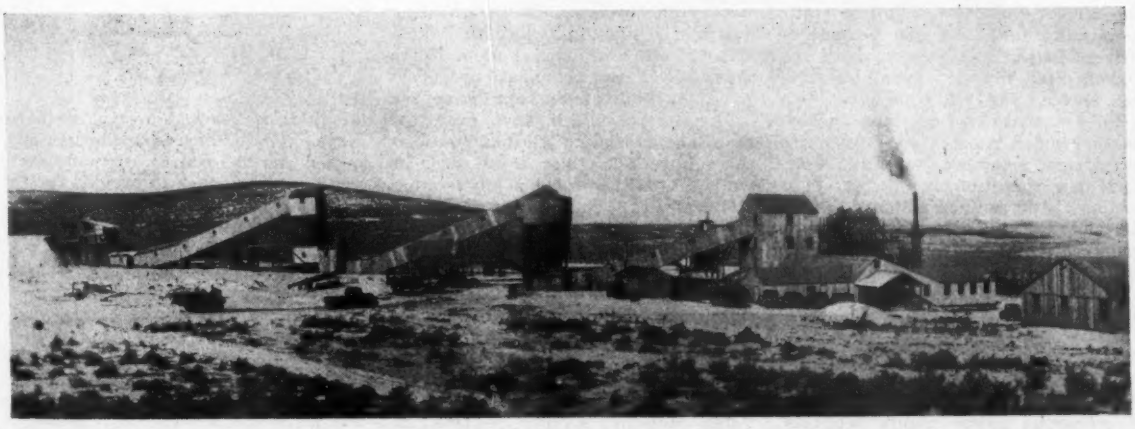
In addition to the dilemma facing the quicksilver producers at present, they are always faced by the problems of the European quicksilver cartel, a combination of the Spanish and Italian producers. The history of that cartel is not such as to permit domestic producers to look forward to the future with any degree of confidence. In the past the cartel has controlled some 85 percent of the world's production and in the distribution of markets and the elimination of competition its leaders have followed a ruthless path.

In shipping to the American market and flooding and destroying that market for the American producer, are they attempting to assure for themselves a monopoly in the post-war mercury market? With prospects of the domestic industry being destroyed, it would certainly be well for the American consumer and the Stockpile Division of the U. S. Army to think back on the prices asked for and received by the cartel during the war years. With the cartel believing in 1940 that its monopoly was complete, prices for the metal were raised to $200 and later to $250* a flask f.o.b. Mediterranean points plus freight and insurance. While the United States Government was paying domestic producers $190 a flask and taking a large portion of that back in taxes, it was also purchasing metal from Spain at prices in the neighborhood of $280 a flask. This, however, did not preclude ample amounts for the Axis still available from both Spain and Italy.

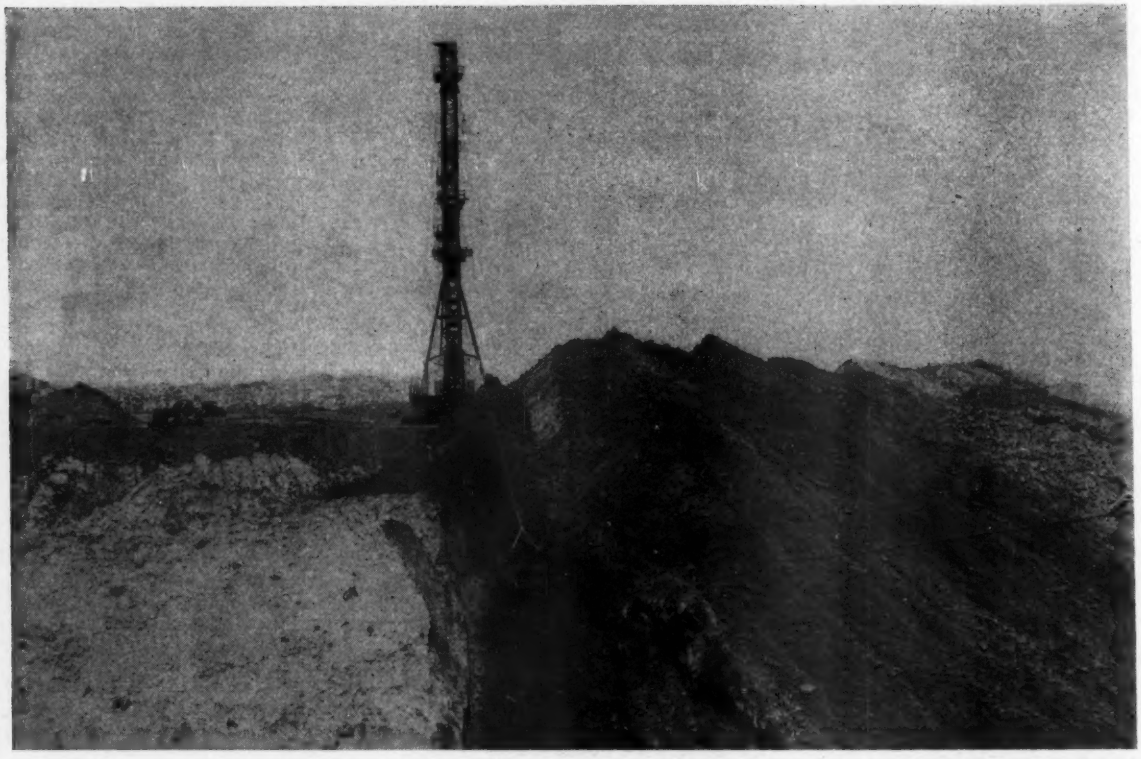
If the United States is to be secure in meeting requirements for any future emergency, the Army Stockpile Board and other responsible Government departments must remember that without a domestic industry they are at the mercy of a European cartel in peacetime and a possible enemy government in wartime. The board should do all in its power to relieve the situation in which American quicksilver now finds itself.

Meantime assistance should also be forthcoming from two other sources, the Department of State and the Department of Justice. In the Department of State rests the responsibility of fulfilling the policy expressed in the Chief Executive's statements concerning lack of confidence in the Spanish Government. Since the policies of the United States Government are antagonistic to cartels it would seem that the Department of Justice would be particularly interested in the activities of the European quicksilver cartel.

* Minerals Yearbook, 1942.



Cordero Mining Company's well laid out plant is indicative of the extensive operations which can be developed on the basis of American quicksilver deposits



The head-tower is 140 feet high. From his 60-foot high perch, the operator can control fully the movements of the 12-cubic yard crescent scraper

The Velva Mine

★ ★ ★

Lignite Coal Producer of Long Standing Furnishes Large Share of North Dakota's Power and Fuel Needs. Operation Employs Novel Tandem Stripping Method

★ ★ ★

THE Truax-Traer Coal Company operates four lignite coal mines in North Dakota: the Kincaid, Velva and Dakota Star strip mines, and the Wilton slope mine. The company is the largest coal producer in the state, accounting for nearly 50 percent of current output. Its newest mine, the Dakota Star, near the town of Hazen, has entered the field this year with a daily capacity of 2,500 tons—a production which it could meet promptly if sufficient manpower were available. This new operation can increase the company's percentage of state output considerably and will make an additional power source available to local industries.

The Velva is North Dakota's Chief Producer

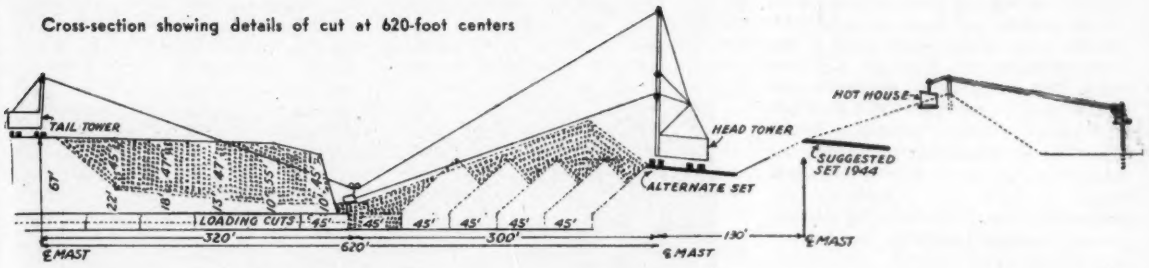
Lignite coal averages about 7,000 B.t.u. per pound and under the boilers of numerous power plants accounts for nearly all of the electric power generated in North Dakota. It also meets a good share of the state's heating requirements. Recent figures of the U. S. Bureau of Mines indicate that nearly 90 percent of the coal used in the state comes from within its borders. The neighboring states of Minnesota and South Dakota import some lignite coal from North Dakota. Nine principal producers mine the bulk of the coal from the 13 properties which have over 100 tons daily capacity. All told, however, there were 184 mines of all sizes at work in 1944, and 111 of these were strip mines. These operations employed over 1,400 men and more could have been used if available. Nineteen hundred forty-four production was 2,515,823 tons, of which 1,533,069 tons came from strip mines. The Velva mine's contribution as the State's largest producer last year was 546,995 tons.

The Velva mine is located near Velva, McHenry County, N. Dak., in the Souris River valley. It is some 28 miles southeast of Minot, from which it is reached over good highways. The mining camp is company-owned and has houses, company store and boarding house to provide for the needs of the approximately 100 employes and their families.

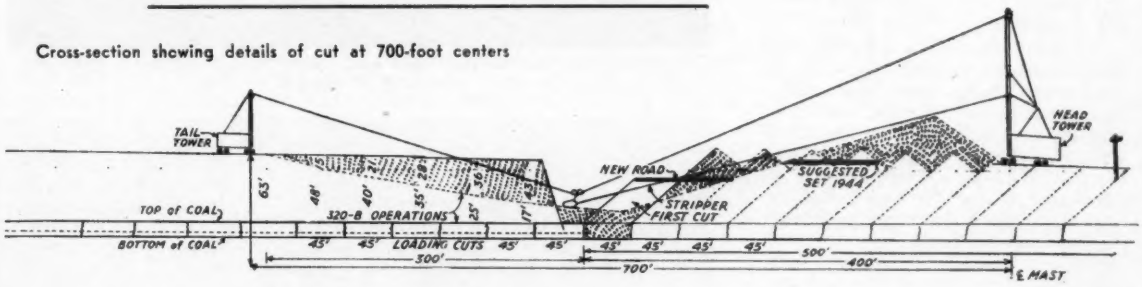
Plan of Operation Involves Three Units

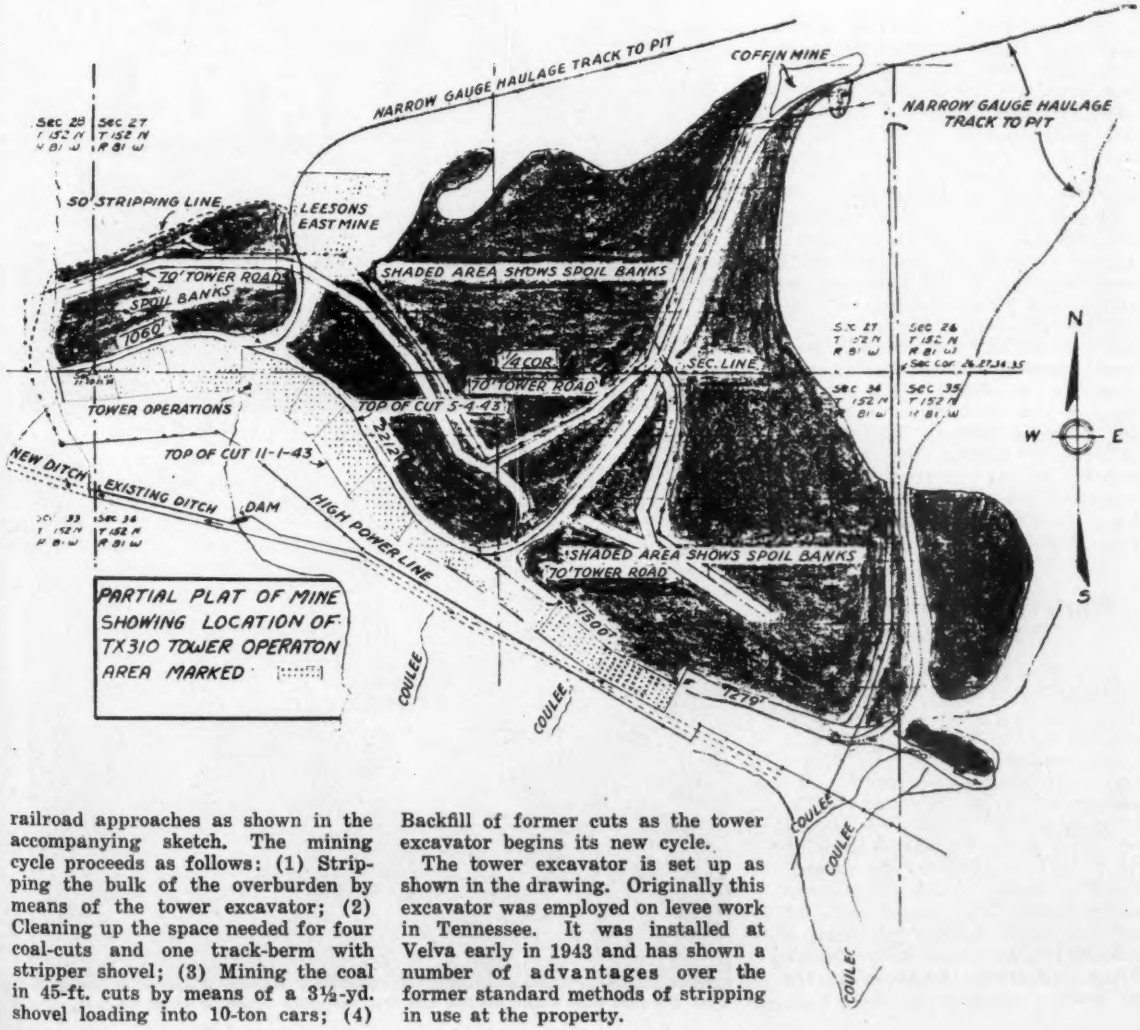
The mine is a stripping operation which was begun in 1927. It is worked at present as a combination of three units—the south pit, the central pit, and the west pit. Although comprising a completely unified operation, the three pits have separate

Cross-section showing details of cut at 620-foot centers



Cross-section showing details of cut at 700-foot centers





railroad approaches as shown in the accompanying sketch. The mining cycle proceeds as follows: (1) Stripping the bulk of the overburden by means of the tower excavator; (2) Cleaning up the space needed for four coal-cuts and one track-berm with stripper shovel; (3) Mining the coal in 45-ft. cuts by means of a 3½-yd. shovel loading into 10-ton cars; (4) Backfill of former cuts as the tower excavator begins its new cycle.

The tower excavator is set up as shown in the drawing. Originally this excavator was employed on levee work in Tennessee. It was installed at Velva early in 1943 and has shown a number of advantages over the former standard methods of stripping in use at the property.

The head tower is an adaptation of 375-B shovel equipment with a mast 140 ft. high which is secured to the base with four guy-lines at each corner. The main motor-generator set of this unit is rated at 600 hp. Electric power is taken from the Ottertail Power Company's 40,000-volt substation which it leaves at 4,000 volts. A high line completely encircles the mine (see sketch) so that a switch-house (locally, hot-house) may be placed as desired. The tower is crawler-mounted with double crawlers at each corner of the base.

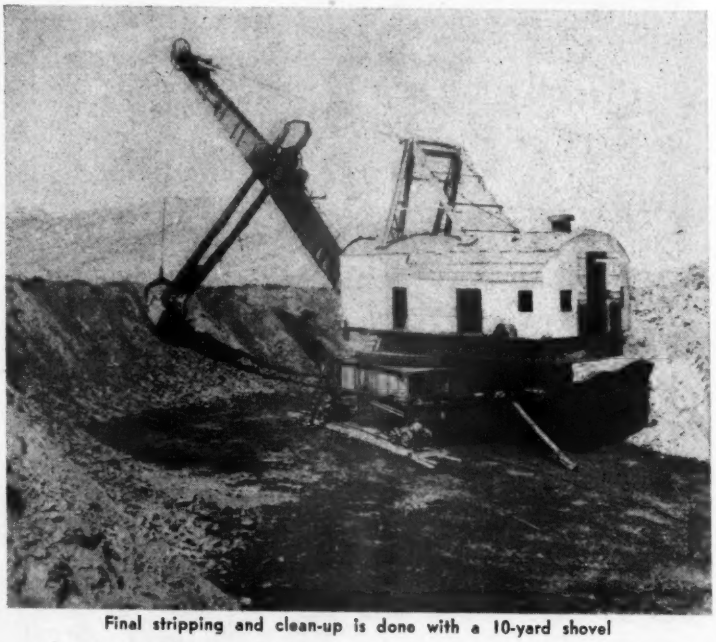
A 12-yd. Sauerman crescent type dragline bucket is used with a 1½-in. drag rope, 1⅝-in. track rope, and a ⅝-in. back-haul. All ropes are 6 x 19 lang-lay except for that on the 320-B stripping shovel which is a 2½-in., 6 x 37. With an average removal of 7,500 cu. yd. per 24 hours, the big ropes last about six weeks, although the local management believes some increase in this may be in sight with contemplated changes in rope size and type.

The tail tower is placed at varying distances from the head tower according to depth, width and profile of cut desired. The sketches herewith show distances of 620 and 700 ft. and the resulting cuts. Overburden this summer (west pit) is averaging about 66 ft. deep although in some parts of the mine it is as little as 45 ft. The coal bed averages 14 ft. in thickness. At present an 850-ft. distance between towers is being used with an improvement in width of coal uncovered per set-up and some expected reduction of bank sloughing. Overburden is a heavy black clay material sometimes sandy and sometimes entirely sand (hard on the cables). It is not hard digging and no blasting is required for the drag bucket. The tower is shut down during the real cold weather but at the stripping shovel operations are year-around and blasting of frost chunks is necessary. The tower begins its season about May 1.

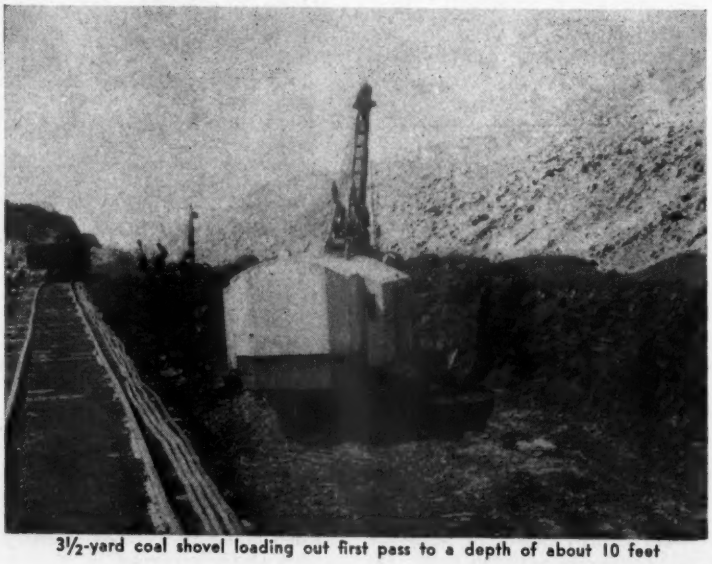
Work Done by the Tower Excavator

In operation, the tower engineer sits in a cab 60 ft. above the ground. He keeps his bucket passing and as he pulls the dirt toward him develops a long smooth slope in front of the tower. He moves his machine sidewise on signal, as does also the tail tower man. When he has finished a cut, there is an average of some 15 ft. of overburden left for the stripper shovel to handle. Wind and summer weather give little trouble but the fog is sometimes bad as it becomes difficult for the engineer to see the distant tail tower, the bucket or the cut itself.

General view over tower-stripped area. Note 10-yard stripper in distance cleaning off the coal



Final stripping and clean-up is done with a 10-yard shovel



3½-yard coal shovel loading out first pass to a depth of about 10 feet

When a cut has been completed in one of the three pits, the excavator moves to another pit where a roadway or bench has been prepared to set up for a new 250-ft. advance where the overburden can be pulled over into the four cuts from which the coal has been removed—which have already been partly covered by the stripper shovel. Levelling and building up of these roadways is being done with an RD-7 tractor and a 6-yd. La Plant Choate wheeled scraper.

Final Stripping by Big Shovel

The final stripping, including a good clean-up of the top of the coal is done by a 320-B shovel with a 10-yard bucket. It opens up an 80-ft. width which is sufficient for a track berm of 35 ft. and a 45-ft. coal cut. Even with this broad bench, the overburden sometimes sloughs in from the sides necessitating a clean-up job to clear the loading tracks. Work progresses from the shallow to the deep side in the stripping process. The toe of the bank ahead of this shovel is cleaned up by hand thus leaving a good bank for the coal shovel.

The stripper is mounted on steel-wheeled trucks running on rails. As it moves up, rails and ties are removed from the rear and carried forward in a stone boat pulled up by the bucket. The stone boat is returned by being pulled back beneath the shovel. For this purpose, a gin-pole is arranged with hoist as shown in one of the photographs. This practice avoids spilling dirt on the coal and saves some bucket time. The stripper operates the year around and, as previously explained finds blasting of frozen ground necessary in winter.

Pit drainage is relieved considerably by a drainage ditch south of the pit. A 2½-yd. walking dragline is used for ditching purposes. Portable centrifugal pumps are used wherever needed. There are six 2-in. and 3-in. pumps with 30 hp. direct connected electric motors and two small pumps of 7½ and 5 hp. available for this purpose.

Coal Removed in Two Lifts

Coal cuts are prepared further by taking a vertical kerf at the solid edge of the proposed cut with a Sullivan coal cutter using a 9-ft. cutter bar. This avoids a ragged edge and leaves a solid bench for the coal haulage track even after blasting.

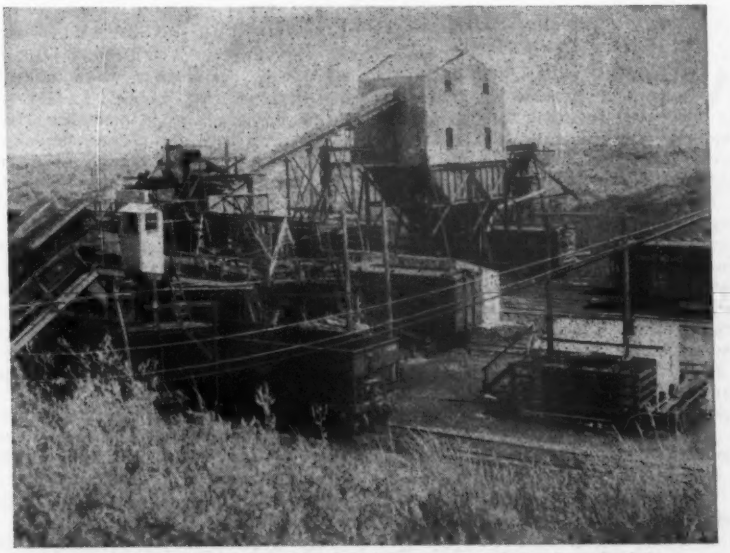
The coal is loosened with moderate (½ bag per hole) charges of Dupont No. 2 free-running granular dynamite. Holes are 2½ in. in diameter and 10 ft. deep. These are spaced in rectangular pattern at 15-ft. centers—giving three rows centrally located with respect to the long axis of the cut. Number 6 no-delay electric blasting caps with 10-ft. wires are used with four to eight holes blasted at a time. Breakage is generally satisfactory. Such variations as occur are taken care of by the adjustable roll crusher at the screening plant.

Blast holes are drilled with a vertical coal drill constructed in the company shops. This 2½-in. auger uses a replaceable-tooth cutter head. It is powered by a five horsepower electric motor which picks up its power from a nearby transformer. The rubber tire mounting makes for easy portability. Coal is loaded into narrow-gauge railroad cars with a 3½-yd. 50-B electric shovel which receives its power by cable at 4,000 volts. The shovel makes one pass removing the coal to about 10 ft. deep and full width—above a clay parting which varies from 2 to 3 in. in the south pit to 4 ft. in the west pit. A second pass recovers the bottom coal and takes the edge along the stripping bank. An RD-6 tractor and LeTourneau dozer combination is used for the clean-up work involved here.

Haulage Practice and Screening Facilities

Plymouth gasoline driven locomotives (rated at 14 tons) haul the coal in 10-ton Koppel side dump steel cars at five cars per trip. The 36-in. gauge track is constructed of 60-lb. rail on 6-ft. ties. Grades are moder-

Blast holes are spaced at 15-foot centers and are 2½ inches in diameter



Coal passes by flight conveyor to the dry screening plant where facilities are available to make lump, egg, stove, stoker and screenings

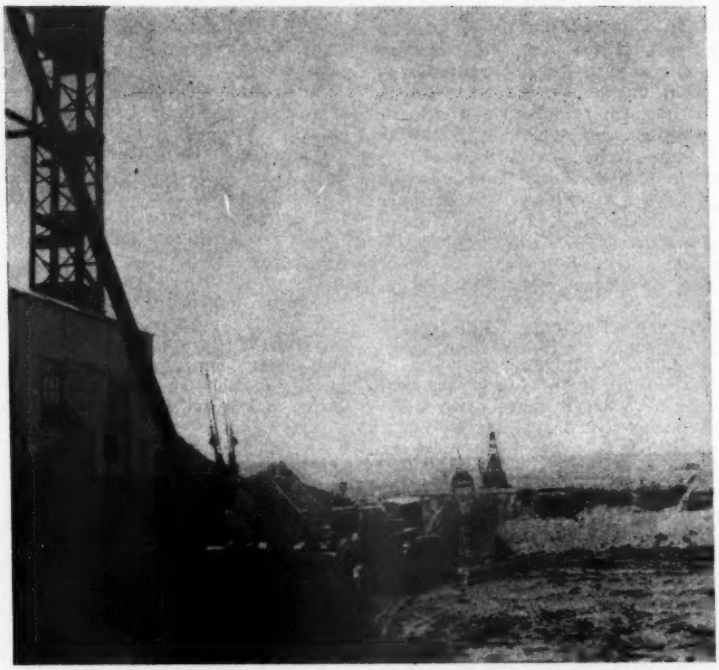
ate and mostly level and track is laid to each of the three pits (see sketch). Total narrow gauge railroad trackage on the operation is about 3½ miles. All coal is taken to a 40-ton receiving hopper at the screening plant.

Coal passes by flight conveyor to the dry screening plant where facilities are available for making lump, egg, stove, stoker and screenings. Storage space is available for emergency over-run.

Coal is taken from the bottom of the hopper by means of a slow moving feeder belt and passes thence to a faster moving sloping feeder which discharges into a double roll crusher with adjustable toothed roller which may be altered according to the coal received.

A 60-in. flight conveyor takes the coal up to the screens whence the lump and egg sizes are first removed. Arrangements are also available to by-pass to a hammer mill when necessary at this point. Finer than egg goes by conveyor and elevator to the screening plant where 1½ in. by 4 in. stove, ½ in. by 1½ in. stoker and minus ½ in. screenings are made. A large storage space is available on the ground for emergency over-run of—½ in. screenings. These screenings are loaded into cars later by means of a small drag scraper. Most of the coal for shipment is loaded into box cars. The company owns two standard gauge 60-ton locomotives which haul the finished product to Voltaire, 10 miles away. An automatic weighing scale is located a mile beyond the plant. Voltaire is the company shipping point on the Soo Line railroad.

At mine headquarters facilities are available for repairs to all equipment such as tractors, locomotives, shovels, cars, drills, etc. Engineering, clerical, warehouse and other general services are housed here and it is but a short walk to the store, boarding house, bunk houses and employes' homes.



Movement of the head-tower over the spoil banks is facilitated by roadways built with tractor and wheeled scraper. Tall tower in the distance

MINING CONGRESS JOURNAL is indebted to the following members of the Truax-Traer organization for their most valuable assistance in the preparation of the foregoing account: T. G. Gerow, vice president in charge of operations; W. E. Keller, vice president; R. A. Russell, assistant to vice president, at Minot, N. Dak.; B. Dollarhide, general superintendent; R. B. Harlan, sales representative; J. A. Rist, mine superintendent; L. T. Ericson, mine foreman; and D. T. Ritchey, engineer.

Industrial Safety Tomorrow

A SPECIFIC program designed to help industry meet the threat of an increased accident toll under the changed conditions of the post-war period has just been offered by 38 national organizations.

The program is contained in a 16-page pamphlet, "Industrial Safety Tomorrow," produced by the National Safety Council. The sponsoring organizations include industrial management associations, labor unions, civic organizations, educational institutions and insurance associations.

Preparation of the pamphlet was handled by a special committee on post-war industrial safety, headed by C. R. Cox, president of the National Tube Company of Pittsburgh, Pa.

Highlights of the pamphlet:

"Accident prevention in American industries has reached a new high since Pearl Harbor. Under the patriotic urge to 'save manpower for warpower,' employers have intensified their efforts. Labor . . . Government agencies . . . insurance companies . . . have given encouragement and technical assistance. As a result, fewer workers were killed in occupational accidents in 1944 than in 1941. . . .

"Millions of workers are changing and will change from jobs which they learned to do safely to jobs whose techniques they must master. They will be in unfamiliar surroundings, often with incompletely organized supervision and inadequate equipment. . . .

"Most of the men and women returning from the armed forces are bringing new abilities and skills, greater maturity. . . . Some veterans, however, present readjustment problems, mostly temporary. . . .

"An effective safety program must have the wholehearted support of top management and employe acceptance and cooperation."

The pamphlet details an effective industrial safety program.

The need and opportunity for cooperative effort to prevent accidents is stressed. The individual company or plant can secure safety assistance from several types of organizations:

1. Government agencies. 2. Insurance companies, agencies and associations. 3. Machine manufacturers, suppliers of safety and other industrial equipment. 4. Civic, professional and commercial associations dealing with safety, health and fire, with business in general or with a particular industry. 5. Labor organizations. 6. Educational institutions.

"The effective conduct of all these activities requires adequate, competent, well-trained personnel and definite, adequate budgets. . . . Complete coordination and cooperation of all agencies is urgently needed if industrial accidents are to be reduced to a minimum."

Testing Safety Catches on Mine Cages—(Part II)

Specially Designed Tripping Devices and Permanently Installed Equipment Featured at Some Mines

By CLYDE M. PEARCE
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and
FRANK E. CASH
Supervising Engineer
Health and Safety Branch,
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Duluth, Minn.

EDITOR'S NOTE: Testing procedure for mines A to F appeared in Part I, September MINING CONGRESS JOURNAL.

Mine G || Hoisting Rope Disconnected For Drop Test

Production at mine G is about 2,000 long tons of iron ore a day, with 324 employes working underground. Four vertical shafts are in use, but only two, one about 2,200-ft. and the other 1,200-ft. deep, are used for the transportation of men and supplies. The hoists are equipped with automatic controllers for protection against overspeed and overwind. The ore is hoisted in skips, and men and supplies are transported in cages. The cages are equipped with safety catches, which are tested by dropping a short distance once each month.

When the safety catches are to be tested, the cage is hoisted into the head frame, two 12- by 12-in. timbers are placed across the shaft at the collar, and the cage is lowered onto the timbers. The hoisting rope is disconnected from the cage, and a tripping device, shown in Figure 7, is installed between it and the cage. The cage is hoisted a few feet above the timbers, the tripping device is sprung, and the freed cage falls until the safety catches function. According to report, the distance dropped varies from 2 to 4 in., depending on the condition of the wooden cage guides. About 20 minutes are required to make the test.

Mine H || Cage Suspended by Chain Supported by Steel Pipe

The four-compartment shaft at mine H is 700 ft. deep; two compartments are used for the skips and are operated in balance, one compartment is the ladder and pipeway, and the fourth compartment is the cageway. Average daily production is 400 long tons of iron ore, with 30 men employed underground. The hoists are equipped with Lilly controllers for protection against overwind. The safety catches are inspected every week, and they are tested by the slack-rope drop-test method every month.

When the safety catches are to be tested, the cage is hoisted into the head frame, and a piece of 12- by 12-in. timber is placed across the shaft at the collar. A piece of 6-in steel pipe is placed across the cageway in the head frame above the cage; a chain is passed over the pipe and through a clevis attached to the drawbar of the cage, and the ends are fastened together by means of the tripping device illustrated in Figure 8. The cage is lowered, until it is suspended on the tripping device, and enough slack is pulled in the hoisting rope to insure that it will drop to the timber across the collar if the safety catches fail. The tripping device is then sprung, and the freed cage falls until the safety catches function. It is reported that the catches have never failed to stop the cage, and that the maximum drop is 3½ in. The test had been made with a dead load on the cage, and the results were the same.

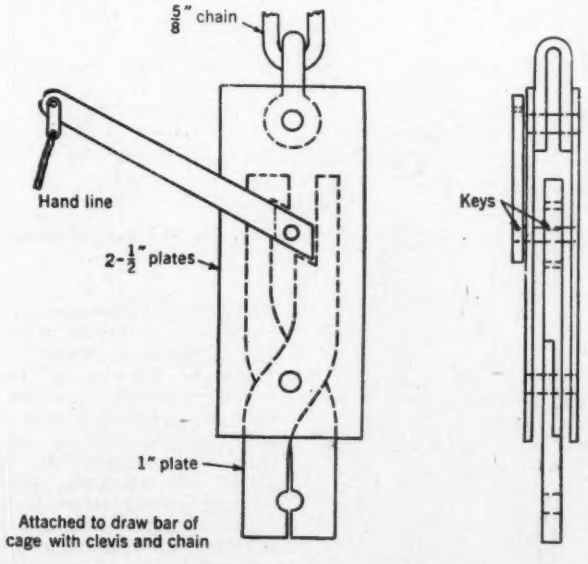


Fig. 8. Tripping device—Mine H

Mine I — Supporting Chain Held by Timber Beam

The shaft, 2,100 ft. deep at mine I has only two compartments, both of which are used for hoisting. The cages will hold a maximum of 12 men, and the skips, which are suspended under the cages, carry 4 tons of ore when loaded to capacity. An output of about 1,100 long tons of iron ore is produced daily by the 86 men employed underground. The skip-cage units, which weigh about 8 tons each, are operated in balance. The single-drum, electric-powered hoist is equipped with a Lilly controller for protection against overwind and overspeed. The safety catches are tested every month by the slack-rope, drop-test method.

When the drop test is to be made, the unit is hoisted into the head frame, and two 5-in. steel H-beams are placed across the shaft at the collar. An 8- by 10-in. timber is placed across the cageway in the head frame above the unit; a ⅝-in. chain is passed over it and through the thimble on the top of the cage, and the ends of the chain are fastened together with a tripping device, as shown in Figure 8. The unit is then lowered until it is suspended by the chain and the tripping device, and 4 or 5 ft. of slack is taken in the hoisting rope. The connecting chain is adjusted for each test so that the cam teeth will engage the wooden cage guides in an undamaged place. After the unit is in position for the test, timbers are placed on the H-beams across the shaft until they reach a point about 10 in. below the skip, to limit the fall of the unit if the safety catches fail. When the arrangements are complete, the tripping device is sprung by pulling the trigger with a hand line, and the freed unit drops until the safety catches function. It is reported that the catches have always stopped the unit after a maximum drop of 5 in.

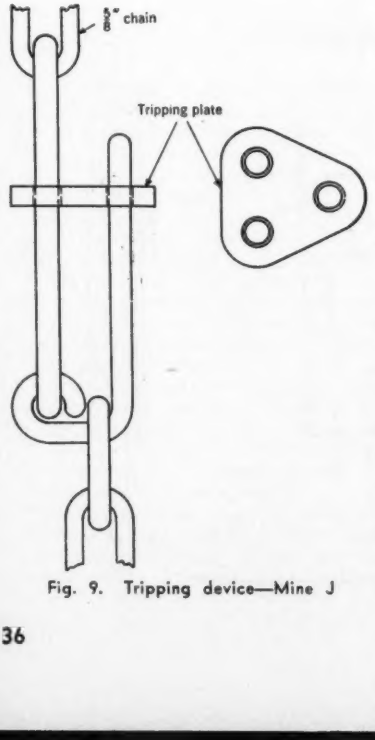


Fig. 9. Tripping device—Mine J

Mine J — Specially Designed Tripping Plate Releases Cage

An output of about 1,000 long tons of iron ore is produced daily from mine J by working two 8-hour shifts with a total of 75 underground employes. The ore is hoisted through a shaft about 450 ft. deep by means of two skips working in balance. Men and supplies are transported in a cage. The safety catches are inspected weekly and are tested once each month by the slack-rope drop-test method.

When the drop test is to be made, the cage is hoisted into the head frame, a 3-in. wooden plank is placed across the shaft at the collar, and a 45-lb. rail is placed on the plank. An oak railroad tie is placed in the head frame above the cage; a ⅝-in. chain is passed over the tie and through the clevis on the drawbar of the cage, and the two ends of the chain are fastened together by means of a tripping device, a sketch of which is shown in Figure 9. The cage is lowered until it is supported by the chain and tripping device, and 5 or 6 ft. of slack is pulled in the hoisting rope. When these arrangements have been completed, the triangular plate of the tripping device is driven upward with a hammer until the hook springs open, releasing the chain and freeing the cage, which drops until the safety catches function.

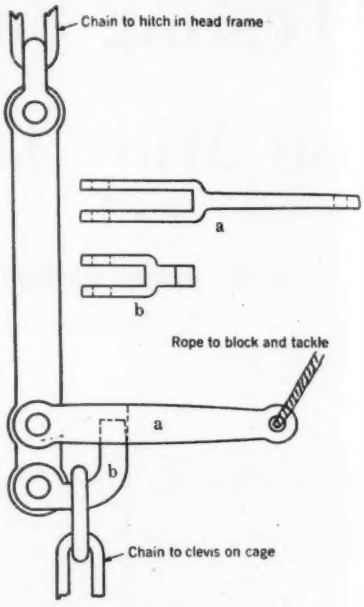


Fig. 10. Tripping device—Mine K

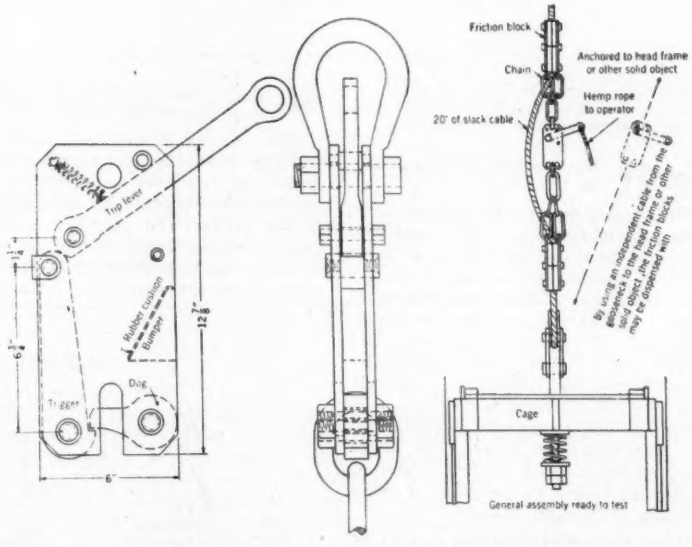


Fig. 11. General arrangement of permanently installed equipment—Mine K

Mine K — Testing Equipment Permanently Installed; Trip Chain Has Links for Seven Tests

Mine K has two shafts, one vertical and one inclined, each about 3,000 ft. deep. The vertical shaft is equipped with two skips and a cage. The inclined shaft is used essentially for ventilation purposes but is equipped with a cage, as it is an emergency outlet from the mine. The cage in the hoisting shaft will carry a maximum load of 90 men when both decks are loaded.

The two skips are operated in balance, and the cage is balanced with a counterweight. Each unit is handled with a single-drum hoist, which is safeguarded with a Lilly controller for protection against overspeed and overwind. The safety devices are inspected weekly, and tested monthly by the slack-rope drop-test method.

Testing equipment is permanently installed in the head frame of the hoisting shaft, and a clevis is installed on the cage to facilitate the test. When the cage is to be tested, it is hoisted into the head frame, three 12- by 12-in. timbers are placed across the shaft at the collar, and a chain is installed between the tripping device (Fig. 10) and the clevis on the cage. The cage is then lowered until it is supported by the testing device, and enough slack is taken in the hoisting rope to insure that the cage will drop to the 12- by 12-in. timbers if the safety catches fail. When these arrangements have been completed, the tripping device is sprung by means of a hand line, which is passed through a set of pulley blocks, and the freed cage drops until the safety catches function. The chain used for this test has seven special links for attaching to the hook of the tripping device, so that seven tests may be made with the safety catches engaging in a different place in each test for each change of the renewable sections of the wooden cage guides.

The same general procedure is followed when testing the safety catches on the cage at the ventilation shaft, but the tripping device used (Fig. 11) is sprung easily with a hand line.

Mine L || Testing Device Clamped to Hoisting Rope

The vertical shaft at mine L is about 2,000 ft. deep, and daily production is about 800 long tons of iron ore, with 75 men working underground.

When the safety catches are to be tested, the cage is hoisted into the head frame, and two 12- by 12-in. timbers are placed across the shaft at the collar. The cage is lowered onto the timber, and 12 to 15 ft. of slack is pulled in the hoisting rope between the hoist house and the head frame. A testing device is clamped to the hoisting rope so as to form a loop with the slack in the rope, and the cage is hoisted a few feet above the timbers that block the shaft. When these arrangements have been completed, the testing device is sprung, and the freed cage drops until the safety catches function.

Mine M || Toggle Joint Tripping Device Used for Drop Tests

The shaft at mine M is about 1,900 ft. deep. Eighty men are employed underground, and an output of about 700 long tons of iron ore is produced daily.

When the safety catches are to be tested, the cage is hoisted into the head frame, and two 12- by 12-in. timbers are placed across the shaft at the collar. A testing device in the head frame is swung out into the cageway and is attached to the top of the cage. The cage is lowered until it is suspended from the testing device, and slack is taken in the hoisting rope. When arrangements are complete, the tripping device (Fig. 12) is sprung by means of a rope attached to the toggle joint, and the freed cage drops until the safety catches function.

Conclusions and Recommendations

The cages used in the Lake Superior district are equipped with safety catches that appear adequate and efficient; however, exhaustive inquiry has not disclosed a single cage accident that involved use of the safety catches. This leads to the conclusion that inspection and care of the hoisting ropes are sufficient to prevent rope failures when cages are in operation.

When safety catches work properly, they function immediately the tension on hoisting rope or drawbar of cage is released, because maximum drop recorded is 5 in., and the average drop is about 2½ in.

The drop tests are believed adequate to insure proper functioning of safety catches in an emergency.

★ ★ ★

All cages on which men are hoisted or lowered should be equipped with safety catches.

The safety-catch mechanism should be inspected frequently, probably daily, for accumulations of foreign matter that might interfere with their action in an emergency.

The safety catches should be tested at least monthly by the slack-rope drop-test or similar method.

These tests should be made from a normal operating position without disturbing the safety catches or their actuating mechanism before the cage is dropped.

★ ★ ★

Periodic inspection of safety catches may be too casual or infrequent at some mines, because instances were cited of safety catches that were found to be obstructed and did not function when tested. Two instances were cited where the cage dropped to the bottom of the shaft during tests because the shafts had not been covered at the collar.

The catches appear to function efficiently both when cage is empty and when it carries a normal dead load.

A more severe test would release safety catches while cage is moving down the shaft at maximum normal speed with normal dead load, but the only purpose of such a test would be to determine the strength of the safety catches and wooden cage guides. It is believed unwarranted in view of cage-accident history.

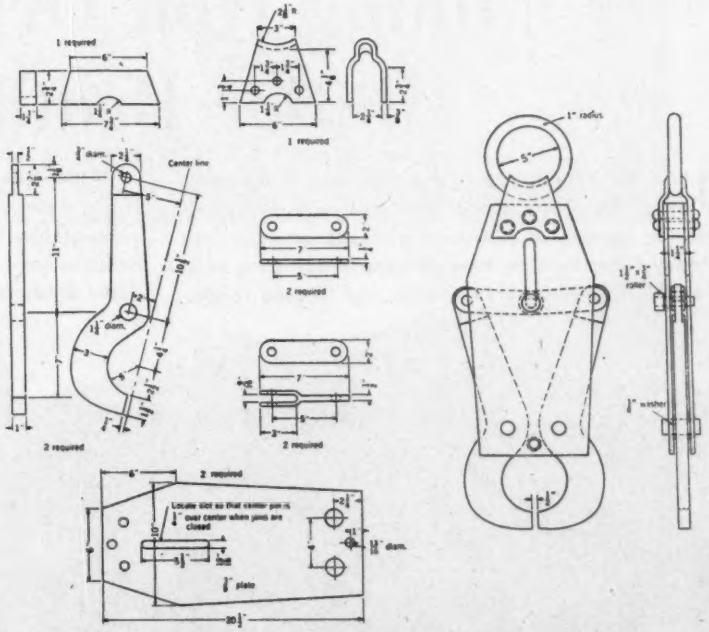


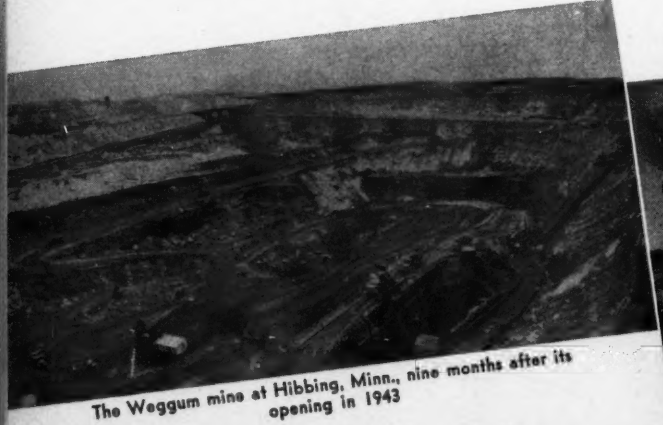
Fig. 12. Toggle-joint tripping device—Mine M

Ore stacker arrangement as set up at the Louise Mine, Cuyuna range. 30-ton ore-hauling truck in foreground

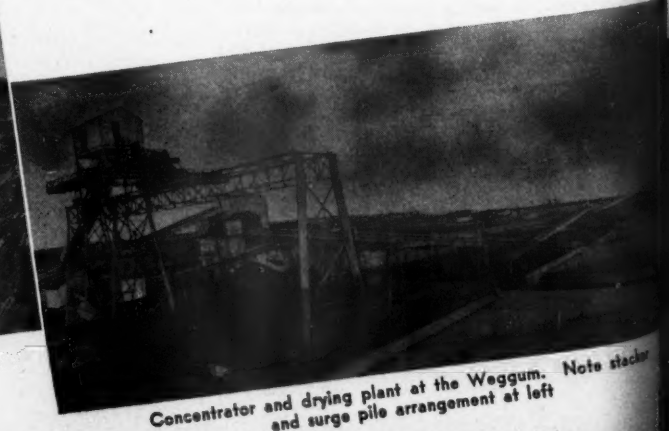
Mining Iron Ore With Butler Brothers

IN 1902, John Butler went to the Mesabi Range to strip the Leetonia and Cyprus mines. The intervening years have witnessed a steady advance until today Butler Brothers have 28 mines—operating or in reserve—on Minnesota's Mesabi and Cuyuna ranges.

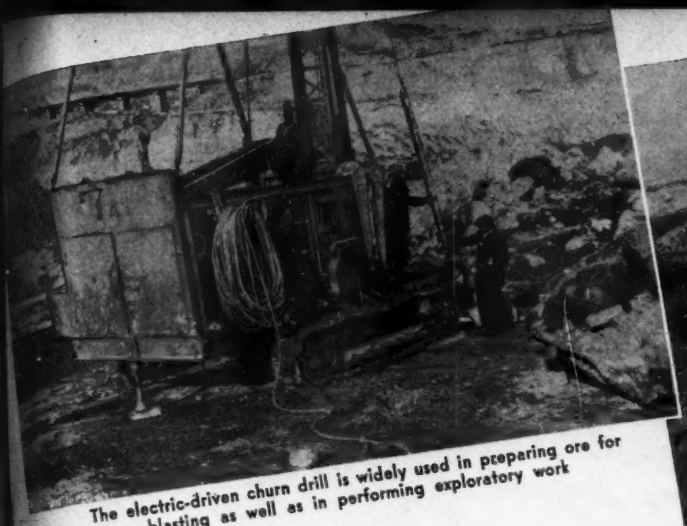
Its pioneering efforts have been the forerunners of many important advances in iron mining practice. The photographs herewith, selected from company files, indicate some of the notably progressive aspects of Butler Brothers mining operations.



The Weggum mine at Hibbing, Minn., nine months after its opening in 1943



Concentrator and drying plant at the Weggum. Note stacker and surge pile arrangement at left



The electric-driven churn drill is widely used in preparing ore for blasting as well as in performing exploratory work

Loading shovels of the type shown share a great responsibility in producing low-cost iron ore

Complete automotive maintenance equipment and a skilled shop force of 140 men are available to service extensive company operations

Ore concentration research holds an important place in iron mining operations

Diesel-powered motor patrols are of advantage in keeping the truck roads in good condition

Winning Combination

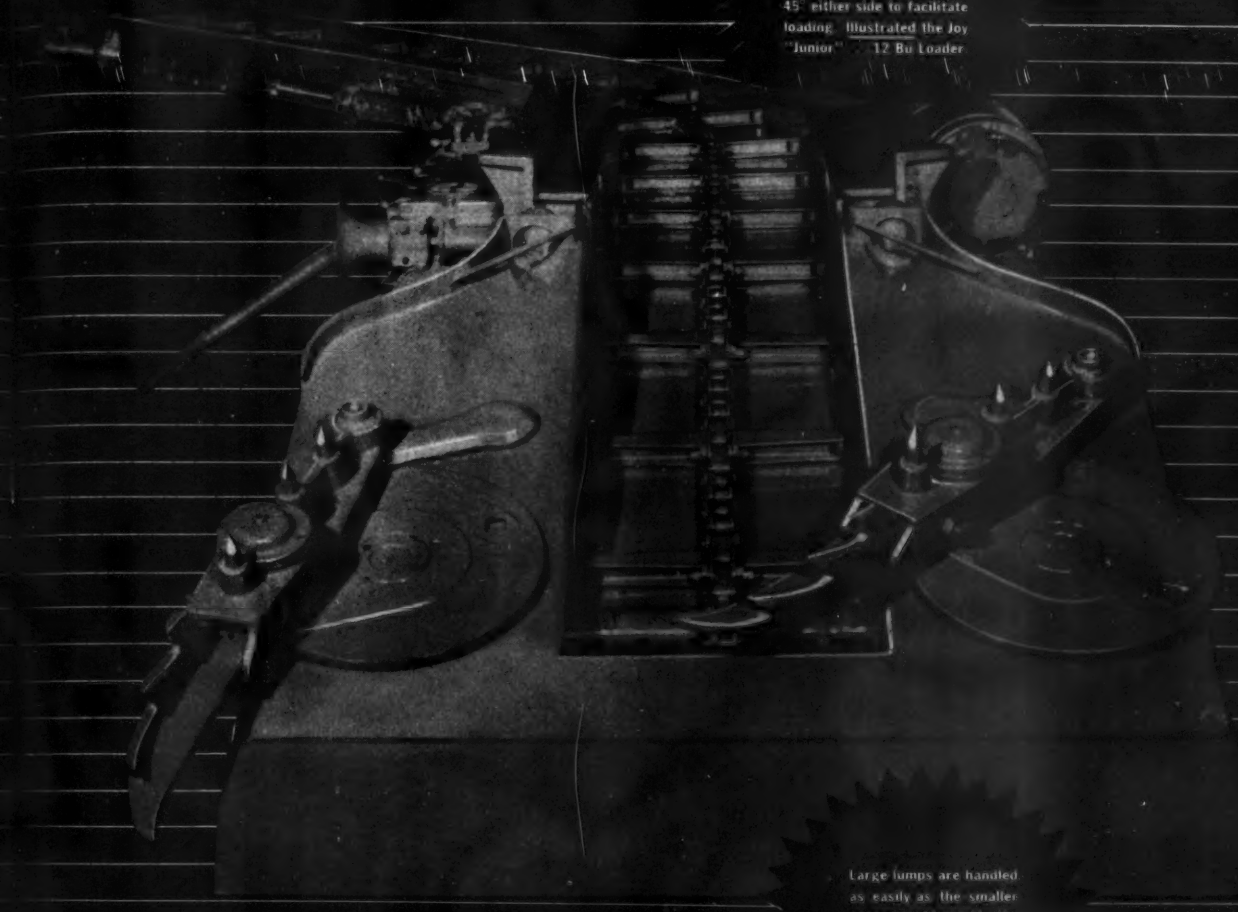
JOY LOADERS and SHUTTLE CARS

Working on a properly timed schedule, the Joy Shuttle Car and Loader Team has proved its superiority over older methods in many mines by producing more tonnage . . . faster and at lower cost per ton.

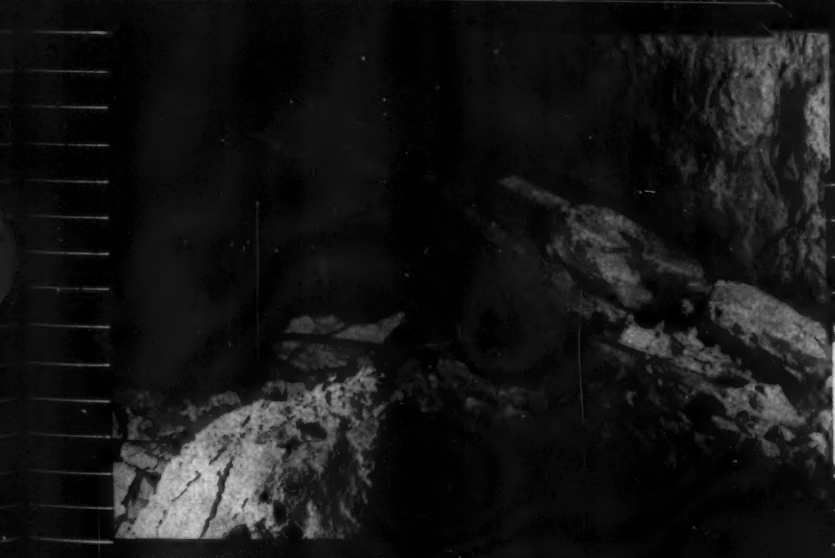
That's a rather strong statement to make, we realize . . . but it's not a bit of an overstatement! For case records can show instance after instance where a Joy Engineer has helped to coordinate production activities, and through use of this winning combination has pulled up production from a slump to a tonnage-breaking hump.

A Joy Engineer is at your service . . . he may be of valuable assistance. There is no obligation.

All Joy Chain Conveyor Loaders are equipped with a self-articulating loading boom which may be swung 45° either side to facilitate loading. Illustrated the Joy "Junior" 12 Bu Loader



Large lumps are handled as easily as the smaller ones, as evidenced by the illustration to the left. This particular loader model is a Joy 11 Bu rated capacity, 5 tons per minute.



Consult a Joy Engineer

JOY

Sinking and Equipping the New Leonard Shaft at Mt. Hope Mine

Fig. 1. The concentrating mill at Mount Hope is designed to treat 3,000 tons of crude ore daily and has units for treating lump and fine ore independently

Warren Foundry and Pipe Corporation, Mt. Hope, N. J., Now Has a New Six-Compartment Shaft 2,674 Ft. Deep With Steel Sets and Concrete Lining Throughout

By WM. EATHORNE
Mining Engineer
Albany, N. Y.

THE usual life of a mine, whether coal or non-coal, surface or underground, ordinarily spans a decade; relatively few are operated actively as long as 50 years. However, attention has recently been called to an iron ore mine that has been in operation with slight, if any, interruption for more than 200 years. This "old timer" has now come into the limelight chiefly through production demands of the war, resulting in sinking what is probably the deepest and certainly one of the most modernly equipped mine shafts in the eastern part of the United States.

The mine is about three miles north of Dover, N. J., and is operated by the Warren Foundry and Pipe Corporation of Mt. Hope, N. J. Historically the mine is of far more than ordinary interest, as it is said that its iron ores were used for cannon and other military equipment for George Washington's armies in the Revolutionary War as well as for more or less similar purposes in the War of 1812, the Civil War, World War I, and World War II.

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Maximum Iron Ore Production Called for

When the Federal Government, through the War Production Board, early in 1941 called for maximum production from the iron-ore mines of the United States, this mine was hoisting ore from a relatively small, shallow shaft, which had been reconditioned in 1914. This shaft was being worked to its full capacity, but the mine production was by no means the maximum that the various ore bodies could furnish. The concentration plant was also working to its maximum capacity, and when it was decided to take steps toward increasing the output from the mine by sinking a more adequate hoisting shaft it was necessary also to furnish a concentrating plant of larger capacity.

The sinking of the new shaft and the construction of the concentrating plant were started late in 1941, and work on both proceeded simultaneously. The last of these facilities to be completed was the shaft, which was put into operation in January, 1945. It now handles all of the ore mined in the Mt. Hope mine.

This paper describes the new shaft, including its sinking, equipping and operation and the numerous novel features should be of interest to persons engaged in the operation of hoisting shafts in any kind of underground mining operation.

Ore First Produced in 1715

The Mt. Hope mine of the Warren Foundry and Pipe Corporation is about three miles north of Dover in Morris County, New Jersey.

That company, with head offices at Phillipsburg, N. J., has been operating this magnetic iron-ore mine since it was taken over from the Replogle Steel Company in 1924. The history of the mine, however, dates back long before that time, for it is reputed to be the Nation's oldest iron-ore mine and perhaps the oldest underground operation in the world for iron-ore extraction. Ore was first produced here in 1715, and its operation has been carried on for the past 230 years with little, if any interruption.

Seven veins, all roughly paralleling each other in both dip and strike but varying distances apart, have been disclosed in development operations from time to time. Only four of these veins have been economically productive in tonnages worth recording. The average dip of the veins is about 68 degrees, and the widths vary from 6 to 40 ft. The country rock on both hanging-wall and foot-wall sides is a granite gneiss.

There are several shafts on the property, and all but two have long since been abandoned. Until recently the Brown shaft, which was reconditioned in 1914, was the only shaft available for hoisting. This is an inclined shaft, 1,080 ft. deep, having a dip of about 68 degrees, equipped with two hoisting compartments and a manway. The other shaft still kept in repair is shallow and is used to assist mine ventilation.

3,000 Ton Mill Constructed

When the War Production Board called for increased production from our iron mines early in 1941, officials of the Warren Foundry and Pipe Corporation saw little chance to respond with the facilities they then had at their command. The Brown shaft was already handling its approximate maximum tonnage, and the concentration mill adjoining this shaft was also operating close to capacity. The circumstances were responsible for a decision to sink and equip a new vertical shaft and to erect a new concentration mill on a suitable location adjoining the shaft. The cost of these facilities, stated to be over $4,000,000, was financed through a private loan.

The concentration mill, designed to treat 3,000 tons of crude ore daily, consists of units for treating lump ore and fine ore independently, both being done by means of magnetic concentration. In addition to the buildings necessary to house the milling equipment, many other buildings were also erected. These include a change house, compressor house, ware house, hoist house, and a house for a central heating plant. All buildings are constructed with concrete block and steel, are compactly located, modern, and may be considered attractive in appearance if the reader will restrict his comparisons to mining operations in general. (See Fig. 1.)

Sinking and Concreting Procedure

This shaft can probably be classed as one of the most modern in the United States. It is believed to be one of the largest, deepest shafts in the eastern part of the country. It has six compartments, is vertical for its entire depth of 2,674 ft., and has steel sets from top to bottom and solid concrete walls throughout. The size of the excavation measured about 21 ft. by 15 ft., the measurements, within the concrete walls or lining being 18 ft. 3 in. by 12 ft. 6 in. The six compartments, three at the north end, one in the center, and two at the south end, have dimensions as follows:

Two skip compartments, 5 ft. 11½ in. by 5 ft. 5½ in.

One cage compartment, 12 ft. 6 in. by 8 ft. 3 in.

One counterweight compartment, 3 ft. 5 in. by 2 ft. 4½ in.

One manway compartment, 3 ft. 5 in. by 5 ft. 9½ in.

One pipe compartment, 3 ft. 5 in. by 3 ft. 6 in.

Level stations have been established 1,000, 1,700, 2,100, 2,300, and 2,500 ft. below the shaft collar. The bottom 39½ ft. of the shaft is used as a sump. Skip pockets and primary crusher stations have been established a little below the 1,700 and 2,500 levels.

Sinking operations were commenced on November 5, 1941, by the Underpinning and Foundation Company of New York City, which was awarded the contract to sink and equip the shaft. The site chosen for the collar is about 830 ft. above sea level and about 1,750 feet east of the Brown shaft. This elevation is about 100 ft. lower than the collars of the two shafts mentioned previously. Granite gneiss was encountered immediately below the shallow surface gravel and continued throughout the entire sinking, with the exception of two small veins of magnetite, encountered in depth.

In the first 203 ft. of sinking, a crane was used for hoisting. This equipment was followed by a derrick, which sufficed for sinking another 96 ft. A temporary wooden head frame was then erected, and by using the derrick hoist another 220 ft. of shaft was sunk. Following this, a temporary steel head frame 65 ft. in height was erected and a 600-hp. electrically driven hoist was installed. The electric hoist had been used previously by the contractor in some shaft-sinking operations in connection with the 113-mile Delaware Aqueduct of the New York City water-supply system—probably the most extensive tunneling project ever undertaken in any part of the world. This equipment sufficed for hoisting and lowering until sinking and lining were completed.

Sinking and Lining Completed First

Shaft sinking and concreting were done concurrently, and this work was completed in March, 1944. The steel sets and permanent shaft installations, such as pipes, electrical cables, guides, and manway ladders, were not installed until sinking and lining had been completed; this work took another 11 months and will be discussed later.

Round sinking buckets of 1¼-cu.-yd. capacity were used for hoisting the broken rock in the earlier stages of sinking; later, 2-cu.-yd. buckets were adopted to partly offset the longer time needed for hoisting and lowering the bucket, which naturally increased as depth progressed. The buckets were operated in conjunction with a cross head to prevent excessive swinging. The cross head operated on temporary steel guides (the same as those used in the permanent installations and which will be discussed later) secured to the concrete of the east and west walls by means of expansion bolts.

During all of the sinking and concreting there were no pipe lines in the shaft to encumber hoisting operations. This problem was solved by placing all such equipment within the concrete walls of the shaft. On the north end a 4-in., steel, compressed-air line and a 2-in., steel, water line, both used for drilling purposes, were embedded in the concrete. Two 8-in. ventilation air ducts of spiral-wound 16-gauge pipe were embedded in the concrete of the east wall. On the west side a 6-in. steel water-discharge line was similarly placed. All these pipe lines were abandoned after sinking and lining had been completed; undoubtedly some if not all of them could be used again if an emergency arose.

Jackhammers and Mounted Drills Used

All drilling was done wet, using both jackhammer and 3½-in. drifter-type compressed-air drills; detachable bits were used with the former while the latter used forged steel. In hard rock, all but the holes at the shaft ends were drilled with drifters; jackhammers were used whenever reasonably soft rock was encountered and for the end holes, regardless of rock hardness. The drifters were mounted on bars of extra heavy pipe, which were set horizontally across the short dimension of the shaft. Two bars, spaced about 6 ft. apart and each supporting two drifters, covered the shaft area with the exception of the holes at the ends. About one-half of the total footage drilled was accomplished by means of jackhammers and the other half by means of the drifters. A round usually consisted of 52 to 56 holes averaging 8 to 10 ft. in depth and took four to nine hours to drill, depending upon conditions encountered. The greatest advance in any one month occurred in May, 1942, when 148.2 ft. were sunk; an advance of 146.5 ft. in the following month was a close second. These advances occurred from a depth of 615 ft. to a depth of 910 ft.

All rounds were loaded with dynamite and detonated electrically, using delay electric detonators. Current for blasting was furnished from a 440-volt, 60-cycle, alternating-current circuit. Since the pipe lines for compressed air, water discharge, water feed and ventilation were embedded in the concrete, only the flexible connections used below the concrete had to be removed when blasting took place. At no time were these flexible lines over 50 ft. long, and for the major portion of the sinking 25-ft. lengths were ample.

All mucking was done by hand. In the earlier stages of sinking it took about 12 hours to muck a round, but later, due to time consumed in the longer hoisting distance, it took about 14 to 16 hours. The complete cycle for drilling, blasting and mucking was carefully planned to take 22 to 23 hours. Water inflow was never greater than 20 gallons a minute and was pumped to the surface in relays when the depth got too great for a single lift. To facilitate mucking, two air-operated sump pumps were used to pump water into the hoisting bucket.

Lining Averages 20 In. in Thickness

High-strength concrete, using washed sand and aggregate but without reinforcement except for the first 60 ft. below the shaft collar, was used in lining the shaft for its entire depth. The minimum thickness of this concrete is 15 in. and its average thickness about 20 in. For reinforcement near the collar, ¾- and ½-in. iron rods were used. The concrete was poured in sections and followed the sinking operation fairly closely. In the early stages, 30-ft. sections of concrete were put in, but later small rock bursts occurring in the unlined sections made it advisable to keep the concrete much closer to the shaft bottom, and the sections were reduced to 18 ft. When concreting was done, it was brought up to a point anywhere between 3 and 6 ft. from the shaft bottom.

Concrete was mixed at Kenvil, N. J., about eight miles from the shaft collar, and delivered in transit-mix trucks. Special buckets for carrying concrete, fitted with a dump bottom, were used to lower the concrete into the shaft. Steel forms 6 ft. in height were used to hold the concrete in place while setting. The forms had to be lowered and hoisted from and to the surface whenever concreting was done. The muck pile at the bottom of the shaft was used as a base on which the forms rested. The last round before concreting was partly mucked by removing all accessible large pieces of broken rock and then carefully leveled to form a bed for a wooden floor. The wooden floor was then placed on the muck pile, and the steel forms were placed in position and braced. The concrete lining was thus brought down to within 3 to 6 ft. above the shaft bottom whenever concreting was done, which on an average took place twice a week.

Openings for stations, skip pockets, and crusher stations were cut while shaft sinking was in the respective vicinity of each. These facilities were enlarged to their required size later.

Reversible Ventilating Fan Employed

A reversible-type electrically operated fan, located on surface, was connected to the two air ducts and fresh air blown to within a few feet of the shaft bottom. Later this fan was removed to the 1,000-ft. level after a level connection about 150 ft. in length had been driven to intersect a drift in the original workings of the Mt. Hope mine. After blasting, the fan was reversed for about 15 minutes to remove smoke and fumes caused by blasting.

The total excavation for shaft sinking (exclusive of stations, etc.) amounted to approximately 820,000 cu. ft., and about 300,000 cu. ft. of concrete were required to complete the lining.

In the sinking and concreting operations a crew of 85 men was employed. Fifty were underground workers, divided into three shifts operating six days each week.

Installing the Shaft Sets and Shaft Equipment

After the mucking and concreting had been completed in February, 1944, work on installing the steel sets and necessary equipment was started immediately. The first work performed was to suspend the electrical conductors in the shaft by means of anchors. Two armored cables having an area of 500,000 circular mils for carrying a 2,300-volt current were suspended at the shaft collar and reached to the 1,000 and 1,700 levels, respectively. Another cable, identical in all particulars, was suspended at the 1,000 level and reached to the 2,500 level. A telephone cable and four signal cables were suspended from the surface. The next step was to start installing the steel sets, the first set to go in being at the bottom of the shaft after which this work continued upward. These steel sets are a little unusual in that there are no wall plates, end plates, or posts. Briefly, they may be described as being only those parts of a shaft set commonly called dividers. They are placed on 6-ft. centers vertically. The two main dividers of 12-in., 25-lb., I-beams extend from the east wall to the west wall; the ends are secured to steel brackets by means of bolts, the brackets in turn being secured to the concrete wall or lining in a manner to be described later. The center section formed by these I-beams is the cage compartment. The north section is further divided into three compartments by using two 8-in., 17-lb., I-beams. These make up the counterweight, the manway, and the pipe compartments. The south section is divided equally into two compartments by means of an 8-in., 21-lb., I-beam; the compartments thus formed are used by the two ore skips. (See Fig. 2.)

Method Insures Permanent Alinement

To facilitate the installation of sets and equipment, a large platform was suspended from the hoist cable, from which the men did their work. Bolted field connections, using ¾-in. bolts and lock-nut washers, secured all I-beams in place. After adjustment, electric spot welding was resorted to in order to insure permanent alinement. Four plumb lines of piano wire were used to guide the workers in alinement work.

All brackets fastened to the concrete for supporting the I-beams and guides, with the exception of the two 17-lb. I-beams at the north end, required four holes 1¾-in. in diameter by 6 in. deep to hold rustproof double expansion shields, by means of which, the brackets were secured to the concrete with the aid of 1-in. bolts 6 in.

in length. The two 17-lb. I-beam brackets at the north end required only two such holes. This work involved drilling 36 horizontal holes into the concrete for each set, 24 being for I-beam brackets and 12 for guide brackets. All holes for this work, totaling over 16,000, were drilled with jackhammers. Both flanges of the 25-lb. and the 21-lb. I-beams were bracketed, while the two 17-lb. I-beams at the north end were bracketed on the bottom side only. Every thirteenth set, or intervals of 96 ft. vertically, all brackets for securing the 12-in. I-beams were omitted and the beams set 1 ft. into the concrete. The electrical cables, already suspended in the shaft before installation of sets commenced, were enclosed in the manway compartment as each set was being assembled and permanently secured to one of the 8-in. I-beams that served as a divider.

The permanent pipe lines for compressed air and pumping were installed in regular lengths at the time the shaft sets were assembled. These lines are 12 in. in diameter and were joined by Dresser couplings.

Special Attention to Guides and Compartment Linings

The eight guides necessary for the operation of the two ore skips, cage, and counterbalance are constructed with 30-ft. lengths of 5-in. 32.7-lb., special tee steel. Installation was carried on in conjunction with the assembling of the sets. The guides are secured to the brackets by means of machined-steel clamps. All guide joints were planned to come in between, and not on, the sets. Ends are kept in alinement by means of the ¼-in. tongue-and-groove joint with which this steel is constructed. A steel plate, measuring 12 by 5 by ⅝-in., placed at the base of each guide joint is used to secure each joint in a rigid manner. Four ¾-in. bolts (two to each guide) fitted with locknut washers provide further assurance of good alinement and a secure joint. (See inset, Figure 2.)

A lining of 14-gauge (about 1/12-in.-thick), corrugated, galvanized iron between the two skip compartments and the cage compartment provides protection to the latter from falling rock which might inadvertently fall from an overloaded skip when hoisting is in progress, or from the skips when in the act of dumping. These linings are secured to lightweight angle steel by means of bolts, the angle steel being secured to the 12-in. I-beams in a similar manner. The manway is enclosed on three sides with 1½-in. diamond mesh woven screen, constructed of No. 10 wire, for protection against falling objects. Both the corrugated-iron lining and the woven-screen lining extend from the shaft collar to the elevation of the skip dumps located near the sheave wheels. Further protection is afforded to men when standing around the shaft collar by enclosing the remaining sides of the two skip compartments, from the shaft collar to the skip dumps, with screen identical to that used for protection around the manway.

Ladders and ladder platforms are constructed entirely of steel. Ladder platforms have been provided at every other set, which is a distance of 12 ft. vertically. Ladder stringers are made of 2½- by ½-in. steel 15 ft. 8 in. in length and are spaced 18 in. apart on the inside. Rungs are of ¾-in. round iron, spaced on 12¼-in. centers. Ladders are set with a pitch of 12 in. in 2½ in., or at an angle of 76 degrees from the horizontal. The top ladder rung at each platform is located about 3 ft. 2 in. above the platform. (See Fig. 3.)

★ ★

(Editor's Note: Skips, head frame, hoists, controllers, modern signalling systems, signal code and other items of this modern shaft will be covered in Part II of Mr. Eathorne's article which will appear in the November MINING CONGRESS JOURNAL.)

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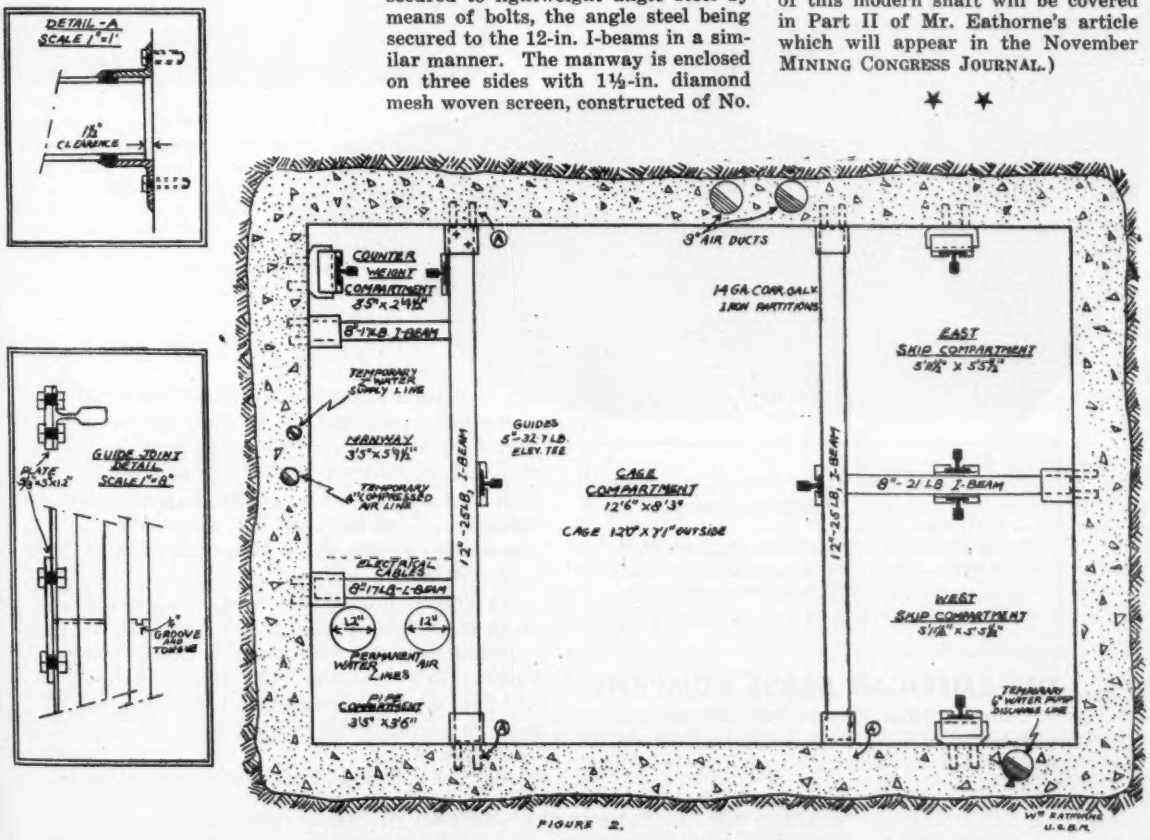
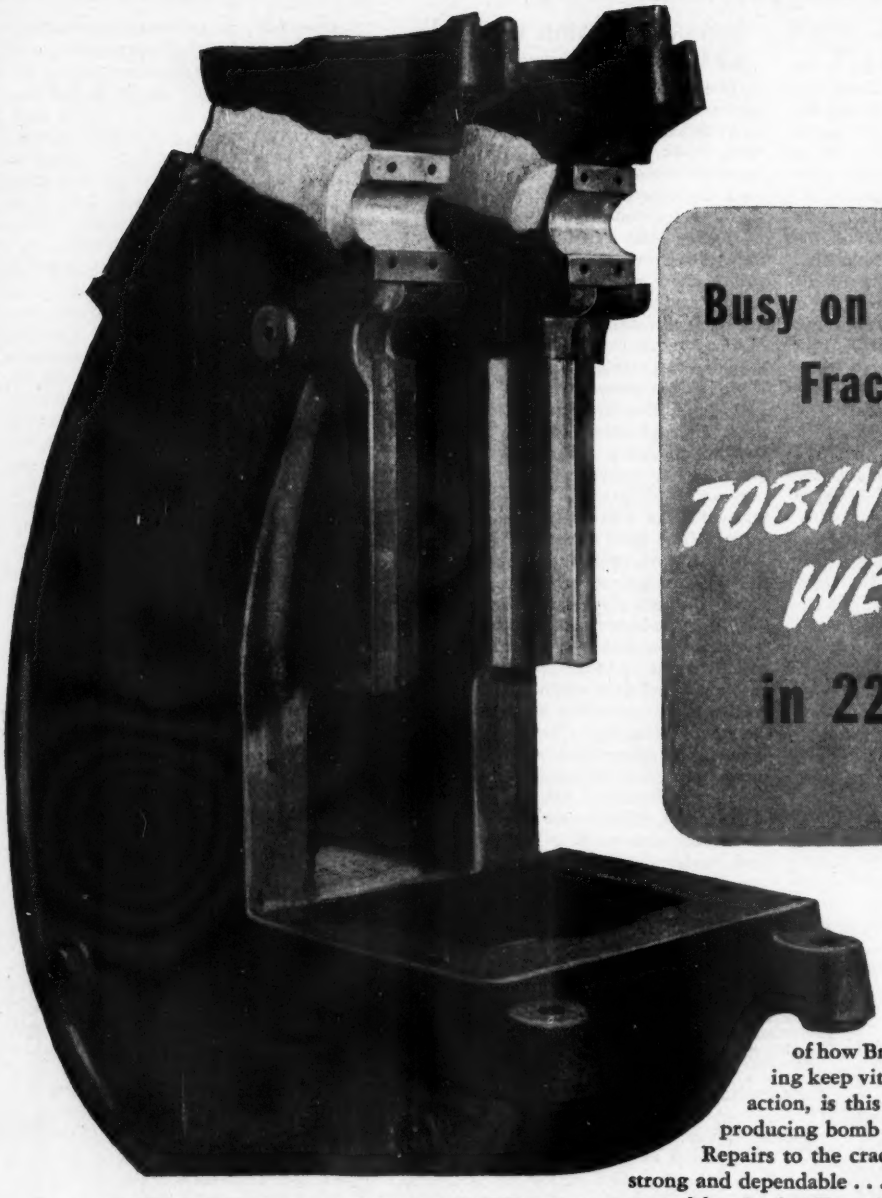


The six compartments provide facilities for ore-skips, cage, manway, pipes and counterweight



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Underground Belt Haulage for Panel and Main Entries

A Report by the Committee on Conveyor Mining

Submitted by A. E. LONG

MINE cars which for many years enjoyed a monopoly in underground transportation no longer have this field to themselves and steel rail must now meet competition with rubber tires and belts. It should be stated however that this competition is in no way an indication that the manufacturers of mine cars and track equipment have been overlooking any opportunities; in fact the reverse is true and many improvements have been made during recent years in car design and in track practices to keep pace with coal's mechanization trend. However the conversion from hand to mechanical operation has not been brought about so much by improvements in previous methods as by the adoption of new techniques and it has happened that in haulage, as well as in other phases of mining, tradition has given way to revolutionary ideas; that is ideas which seemed revolutionary at the time, but which subsequently proved to be practicable.

Early Belt Installations

Belt haulage for underground transportation, although recently coming in for major attention, is not a sudden growth. More than 20 years ago a coal company installed in one of its mines a main line belt several miles long which is still the largest of its type in existence. Shortly thereafter, underground belts were employed on panel entries as gathering units for a battery of rooms being mined with chain or shaker conveyors and about that same time, belt slopes began to replace shafts for hoisting coal at moderate depths from an underground dump to a surface cleaning plant.

Of these three types of installations, the gathering belt has had the widest use; transporting from the room neck to a point on an entry where a trip of mine cars is loaded. First designed for operation in thin seams, this type of service gradually extended from chain "mother conveyors" 300 ft. long, to belts 2,000 ft. and longer, then to tandems, until today there are mines in operation and other mines in prospect, both in high and low coal, that have or plan to have all underground transportation by belts; main line as well as intermediate haulage.

Study on Mine Transportation

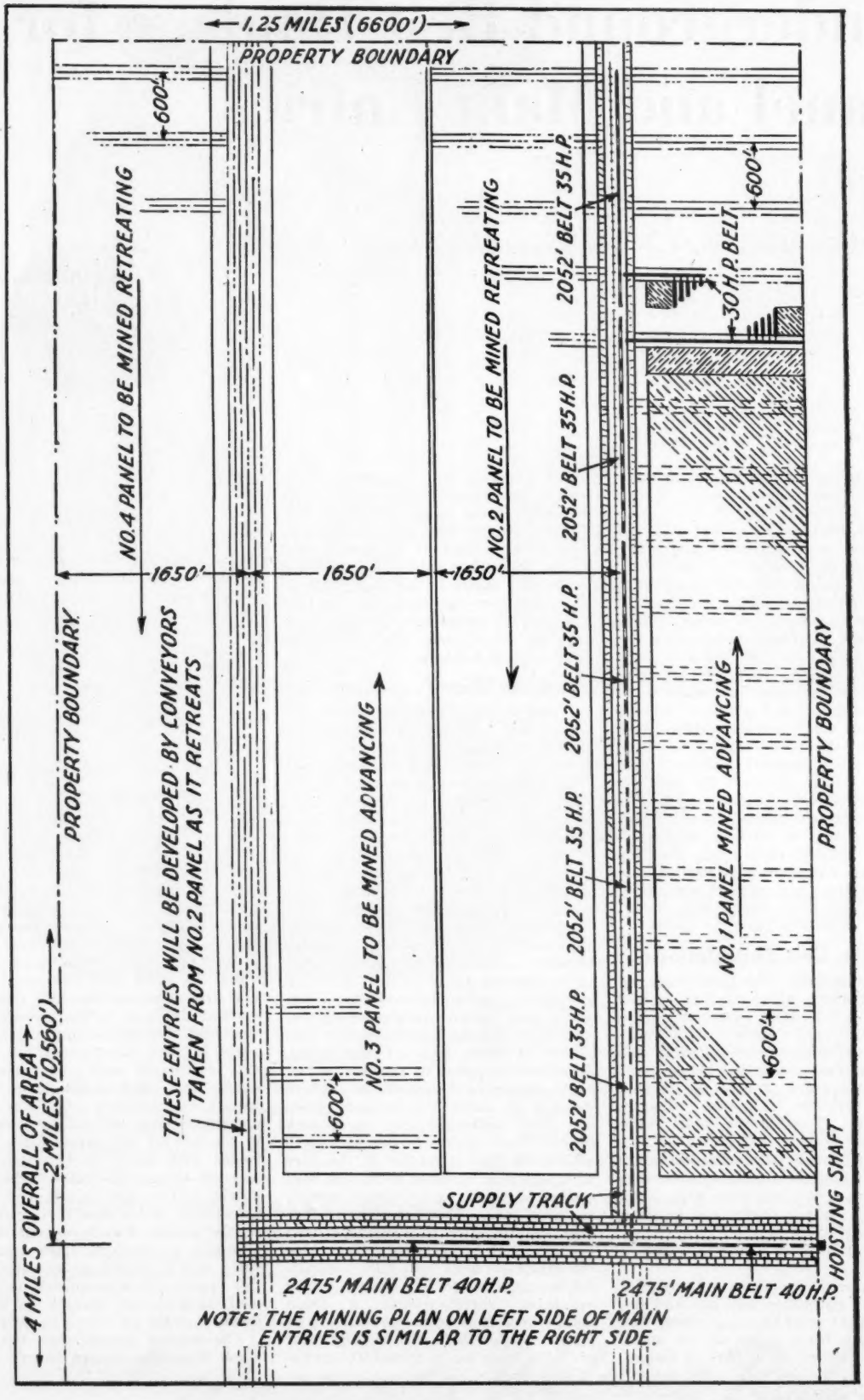
These developments have led to requests from the industry for data on actual experience to show under what conditions mine track and belts each offer the greatest operating advantage and in answer to these requests, the Conveyor and the Haulage Road Committees have undertaken a joint study on this subject. It is not their purpose to formulate a set of rules or specifications or to say whether mine cars or conveyors are best but they do propose to present basic facts to illustrate how individual haulage problems should be approached.

In planning these studies both committees agreed to take similar properties and design systems of mining and underground transportation best suited to each type of equipment. However, in order to confine the reports strictly to transportation, it was decided to cover the haulage from the shaft bottom to the room neck only, without regard to the manner in which the coal is loaded at the face or whether it is taken from the face to the room neck by conveyors, shuttle or mine cars. For the sake of further simplification, mining conditions are assumed to be equally favorable for track or belts and both committee reports are to use the following operating specifications: a seam height of 4 ft. 8 in.; a production of 1,200 tons per shift with a daily total of 2,400 tons on a two-shift operation; a mining area approximately 4 miles long by 1¼ miles wide containing an estimated recoverable tonnage of 21,500,000 tons; a shaft opening at the center of the 4-mile boundary line; grades to be approximately level and the property in general to have no problems of drainage, ventilation or roof support that would affect either transportation system adversely.

All Belt Underground Haulage

The Conveyor Committee in preparing the report which is presented here, has kept to these specifications and the projection on the attached drawing was designed for mining this area with a minimum of entries and consequently a minimum amount of belt. This map shows only half of the property; a set of main headings divides the mine into two equal parts and the area on the left would be worked similarly to the projection on the right. On the assumption that the seam is level throughout the property (although both committees recognize that such a condition is unusual), the mining plan has room entries driving both to the right and to the left off the panel entries. The rooms also work in two directions and all panels, as well as the room entries within the panels are mined advancing on one side and retreating on the other. Two room entries are assumed to produce 1,200 tons per shift, but it should be repeated that this report and consequently the mine projection is not specific as to the actual number of rooms in operation.

The mining system does not need much discussion except to call atten-


1.25 MILES (6600')
PROPERTY BOUNDARY
600'
NO.4 PANEL TO BE MINED RETREATING
NO.2 PANEL TO BE MINED RETREATING
2052' BELT 35 H.P.
600'
30 H.P. BELT
1650'
1650'
1650'
2052' BELT 35 H.P.
PROPERTY BOUNDARY
4 MILES OVERALL OF AREA
2 MILES (10,560')
THESE ENTRIES WILL BE DEVELOPED BY CONVEYORS TAKEN FROM NO.2 PANEL AS IT RETREATS
NO. 3 PANEL TO BE MINED ADVANCING
2052' BELT 35 H.P.
2052' BELT 35 H.P.
NO. 1 PANEL MINED ADVANCING
PROPERTY BOUNDARY
600'
600'
2052' BELT 35H.P.
SUPPLY TRACK
HOISTING SHAFT
2475' MAIN BELT 40 H.P.
2475' MAIN BELT 40 H.P.
NOTE: THE MINING PLAN ON LEFT SIDE OF MAIN ENTRIES IS SIMILAR TO THE RIGHT SIDE.

tion to the fact that the two main entry belts, each 2,475 ft. long, are permanent installations while the panel and room entry belts are temporary, being extended and retracted as the mining advances and retreats and moved to new locations as the areas are completed.

As shown in the tabulated "labor of installing and removing equipment," for completing half the mine property, the five panel entry belts, each 2,052 ft. long, are used twice, making a total of ten unit moves while the two room entry belts, 1,650 ft. long, are each used 34 times, making a total of 68 unit moves. A supply track is planned for the main and panel entries but not in the room headings.

Investment and Operating Costs

The cost estimates submitted in the accompanying table are for a production of 1,200 tons per shift or 2,400 tons per day, making a yearly production of 600,000 tons. It will be noted that these figures cover the transportation system only—belts and supply track—as both committees assume that auxiliary items, such as roof support, drainage and ventilation, would be common to all haulage methods. The labor costs are figured at a flat rate of $1 per hour as on this basis adjustments for other rates can easily be made; the mechanical parts are depreciated 10 percent per year, belting at 25 percent and interest on all the investment at 3 percent annually.

Power underground is to be 250 vdc; the cost for installing the mine distribution lines is figured as a part of the report but the investment for substations is not included. The substations were purposely eliminated as it was the opinion that the conversion facilities—probably two 200 kw sets—would be similar for either belt or mine car haulage and that any differences in the power costs would be in the dc system. The belt starters and controls are contained in the belt estimates but no electrical line equipment for the face machines is included.

Conclusion

In preparing this report the committee has based the mining plan on conveyor experience, the investment figures are current prices and the labor costs are taken from actual belt operations. While it is realized that all these estimates are subject to variations from numerous causes, the committee believes that the costs submitted can be applied to any property by comparing the local conditions with those assumed in the report and adjusting the figures accordingly.

Approved August 15, 1945.
Subcommittee on Belt Haulage.

ESTIMATED COSTS FOR UNDERGROUND BELTS

Estimated Cost of Equipment	Unit cost	No.	Total	
Main heading conveyor:				
Motor, starter, mechanical parts..	$17,694.00	2	$35,388.00	
Belting (4,960 ft. at $4 per ft.)..	19,840.00	2	39,680.00	
Flat heading conveyor:				
Motor, starter, mechanical parts..	15,456.00	5	77,280.00	
Belting (4,114 ft. at $4 per ft.)..	16,456.00	5	82,280.00	
Butt heading conveyor:				
Motor, starter, mechanical parts..	13,080.00	2	26,160.00	
Belting (3,310 ft. at $4 per ft.)..	13,240.00	2	26,480.00	
Total belt conveyor investment				$287,268.00
Supply delivery equipment:				
40 supply cars at $200			$8,000.00	
1 6-ton locomotive			6,500.00	
2 No. 4 switches, 40-lb. rail at $75			150.00	
185 G.T. 40-lb. rail at $47 G.T.			8,695.00	
1050 0000 bonds, 26 ft. long at $ .95			997.50	
1050 40-lb. splice bars at $ .68			714.00	
4200 ¾-in. x 3-in. track bolts at $42 C			168.00	
6000 steel ties			4,200.00	
Total supply delivery equipment				$29,424.50
Power transmission equipment for 250 vdc:				
15500 ft. 00 trolley wire at $76 M ft.			**1,178.00**	
15500 ft. 750,000 C. M. feeder at $440 M			6,820.00	
800 mine hangers complete with clamps at $1.31..			1,048.00	
Total power transmission equipment				$9,046.00
Total investment for equipment				$325,738.50

Estimated Labor for Installing and Removing Equipment
(For half of mine)

Main entry—Belt, 2,475 ft.	800 man hours
Main entry—Supply track, 2,475 ft. ....at 0.13 man hours	322 man hours
Main entry—Turnouts, 4 .....at 23 man hours	92 man hours
Main entry—Power lines, 2,475 ft..... at 0.08 man hours	198 man hours
Panel entries—Belts, 10 units (2,052 ft.) at 650 man hours	6,500 man hours
Panel entries—Supply track, 21,120 ft. at 0.13 man hours	2,746 man hours
Panel entries—Power lines, 21,120 ft. at 0.08 man hours	1,690 man hours
Room entries—Belts, 68 units (1,650 ft.) at 550 man hours	37,400 man hours
Total labor	49,748 man hours
Installation and removal of equipment (10,800,000 tons)	.0046 man hrs. per ton

Estimated Labor for Maintenance and Operation

Belt greasers, 4 at 8 hours	32 man hours per day
Electrician, 1 at 8 hours	8 man hours per day
Supply men, 2 at 8 hours	16 man hours per day
Total labor	56 man hours per day
Maintenance and operation (2,400 tons)	0.23 man hours per ton

Estimated Power Cost

Main belt, 2 at 40 hp.	80 hp.
Entry belts, 5 at 35 hp.	175 hp.
Room belts, 2 at 30 hp.	60 hp.
Total connected load	315 hp.
Average load at 75 percent efficiency and 50 percent continuous	158 kw.
Daily power cost at 2c per kw. for 16 hours	$50.56
Power cost per ton (2,400)	$ .021

Total Operating Costs and Fixed Charges

	Annual	Per ton
Belt motors, and mechanical parts, $138,828 (10 years)..	$13,883.00	$ .023
Belting, $148,440 (4 years)	37,110.00	.062
Supply delivery equipment, $29,424.50 (10 years)	2,942.40	.005
Power transmission equipment, $9,046 (10 years)	904.60	.001
Interest at 3 percent, $325,738.50 investment	9,772.14	.016
Power for belt operation		.021
Supplies for belt operation and power distribution		.005
Labor installing and removing equipment, .005 man hour at $1 per hour		.005
Labor for maintenance and operation, .023 man hour at $1 per hour		.023
Estimated total operating cost per ton		$0.161

Pre-Treated For Shock

Maximum shock resistance is assured for this shovel by two simple facts. One is that rolled alloy steel excels in toughness under recurring impact. Fact two is that all-welded, deep box-section construction is the strongest design principle known.

The new P&H Electric Shovel combines these advantages to the finest degree in both upper and lower frames. Shocks and stresses encountered with every working motion are dissipated before they can reach vital mechanical parts. Design throughout is greatly simplified.

The boom, car body, and revolving frame of a P&H, for example, are welded into completely integral units with the right metal in the right place. All the weight in all parts is live working weight.

The greater rigidity of welded alloy steel prevents weaving, keeps the machinery in line.

Here's a typical P&H contribution in the interest of lower digging costs in open pits. The new P&H Electric Shovels embody many other equally important developments you should know about. Write for Bulletin X-83.

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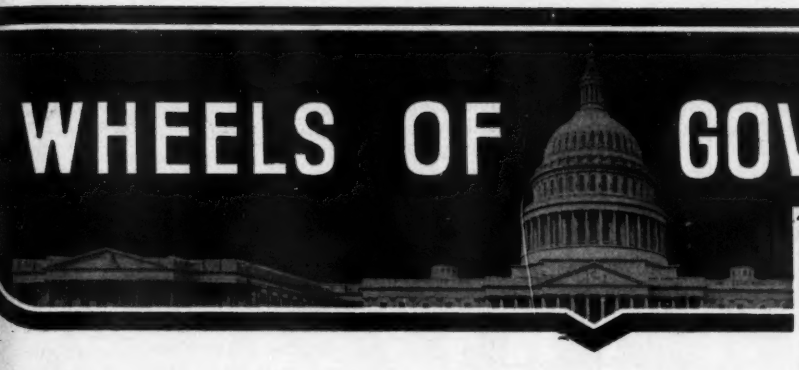

Washington Highlights

CONGRESS: Reconvened September 5, strives for early recess.

TAXES: "Transitional" bill on House floor.

UNEMPLOYMENT: Senate passes modified compensation bill.

"FULL EMPLOYMENT": Senate-approved measure in House Committee.

MINIMUM WAGE: Pepper bill carries harmful provision.

COAL STRIKE: UMWA stalls settlement.

ST. LAWRENCE: Administration Joint Resolution introduced.

SUBMERGED LANDS: House passes bill quieting State titles.

STOCKPILING: White House advocates action.

THE reconvening of Congress on September 5, instead of October 8 as originally planned, found the Senate and House Committees unprepared to report reconversion program bills for floor consideration. The President's message of September 6, in addition to asking unemployment compensation for war workers and enactment of the Murray-Wagner "Full Employment" bill, called for a "transitional" tax measure, higher minimum wages under the Fair Labor Standards Act, power to reorganize government agencies, discontinuance of WLB, permanent status for FEPC, retention of U. S. Employment Service, continuation of military draft for the 18-25 age men, "integrated regional development" of public works and natural resources, a federal research agency and stockpiling of strategic materials.

Immediate concern of the administration is the widespread demand for wage increases, punctuated by serious strikes in industries vital to reconversion and sustained employment. A government-management-labor conference scheduled for November 5 at the behest of Labor Secretary Schwellenbach and Commerce Secretary Wallace will seek to develop a formula for postwar industrial peace.

In his message President Truman stated that "the time has not yet arrived" to proclaim the cessation of hostilities, termination of the war, or of the emergency. He asked that in the interest of orderly procedure repeal of specific statutes or powers be limited by Congress to those which it may definitely mark for termination.

"Transitional" Tax Bill

The House Committee on Ways and Means has sped action on the White House recommendation that an immediate "transitional" tax bill be provided although "room for tax reduction at this time is limited." The President's message also asked that Congress subsequently give careful consideration to "modernization" of the federal structure as a stimulus to business incentive and expansion, as well as consumer purchasing power.

Treasury Secretary Fred Vinson, formerly a leading member of the Ways and Means Committee, personally urged repeal of the corporate excess profits tax as of December 31, 1945, with continuation through 1946 of the "carry-back" provisions. He labeled the excess profits levy method as "to erratic a tax engine to turn loose for even one full year of the post-war period." The recommendations of the American Mining Congress as presented to the committee appear on page 54 of this issue.

The committee first voted to repeal the excess profits tax, effective December 31, 1945, but subsequently changed its policy on this feature. As reported on October 4, the revenue bill would reduce the excess profits tax to 60 percent in 1946 and terminate it altogether as of January 1, 1947; in addition the combined corporation normal and surtax would be reduced from 40 to 36 percent. The bill also repeals the capital stock and declared-value excess profits tax on July 1, 1946. While the 3 per cent normal tax is retained for individuals, taxpayers are permitted to take a $500 exemption for themselves and $500 for each dependent (present normal tax exemption is $500, regardless of family status); surtaxes would be reduced 4 percentage points in each bracket, with a proviso that the reduction in tax liability of any individual should be at least 10 percent. Wartime excise taxes are reduced to pre-war levels, effective July 1, 1946, the flat $5 federal automobile use tax is repealed and the social security payroll tax is again frozen at 1 per cent.

Unemployment Compensation

As approved by the Senate September 20, the administration's unemployment compensation bill was trimmed down from the original recommendation that war workers receive $25 maximum benefits for 26 weeks, with federal funds supplementing state rates and duration. This feature was rejected and in its place the Senate approved an amendment by Majority Leader Barkley of Kentucky providing for the payment of benefits, with federal funds, from the time state payments terminate until the 26th week maximum is reached. As sent over to the House, the bill covered into unemployment compensation about three million regular civilian employes of the federal government and an estimated 400,000 maritime workers. There was also a "return home" travel allowance up to $200; a further Senate amendment would return to the states within 90 days the employment service machinery and personnel taken over as a wartime measure under the U. S. Employment Service. The White House had intended that the USES continue to function until June 30, 1947.

The House Committee on Ways and Means postponed action on the bill indefinitely by a vote of 14 to 10, members stating that it is impossible to determine the reconversion unemployment situation until the current strikes throughout the country are ended. Before acting on indefinite postponement the House Committee had voted 18 to 6 against the $25-for-26-weeks feature. Following a con-

ference of Ways and Means Committee majority members with the President, Chairman Doughton stated that the matter may be reopened when the "transitional" tax bill is out of the way.

"Full Employment"

The Wagner-Murray-Thomas-O'Mahoney "Full Employment" bill passed the Senate September 28 by a vote of 71 to 10 and is now under consideration in the House Committee on Expenditures in the Executive Departments. This bill directs the President to send to the Congress at the beginning of each regular session a "national production and employment budget" representing an estimate as to whether current national production will provide jobs for the nation's labor force. When additional employment is found to be necessary, provision would be made for a program of public works. Consistent efforts by Senator Taft of Ohio to modify the bill resulted in the acceptance of an amendment requiring the President to submit with his job budget, a tax program designed to return to the Treasury over a definite number of years the amounts spent by the government in controlling unemployment. Senator Carl Hatch of New Mexico also succeeded in inserting an amendment which specifies that, "To the extent that full employment cannot otherwise be obtained, the federal government shall, consistent with its needs, obligations, and other essential considerations of national policy, provide such volume of federal investment and expenditure as may be needed in addition to the investment and expenditure by private enterprises, consumers, and state and local governments to achieve the objective of continuing full employment."

Minimum Wage—Pepper

The bill by Senator Pepper of Florida to amend the Fair Labor Standards Act of 1938 is now the subject of hearings before a Senate Education and Labor Subcommittee, and a measure containing some of its features is likewise under consideration before the House Committee on Labor. The Pepper bill would increase the statutory minimum wage from the present rate of 40 cents an hour to 65 cents, with an automatic increase to 70 cents one year after enactment, and to 75 cents two years after enactment. A highly dangerous provision would permit the administrator to fix wage rate structures, possibly far in excess of the statutory minimum, by establishing differentials "between interrelated job classifications." A limitation of five years would also be placed on the time within which employe suits for unpaid wages, overtime, and liquidated damages may be brought.

The bill by Representative Gwynne of Iowa, providing a limitation of two years for public suits and one year for private suits under Federal laws, including the Wage-Hour Act, may be reported to the House by the Committee on Judiciary in the near future. The enactment of this measure means a great deal to coal, metal and non-metallic mineral producers because of the serious hazards involved in suits under the Fair Labor Standards Act.

Foremen's Union—Coal

In the Pennsylvania-Ohio-West Virginia-Kentucky area, increasing shutdowns of bituminous coal mines, due to the controversy over recognition of the United Clerical, Technical and Supervisory Workers' Union of UMWA District 50, brought a request from John L. Lewis on September 28 that the Operators Negotiating Committee meet in Washington to confer with the mine workers. Lewis has now abandoned all pretense of non-affiliation between the supervisory employes' union and the UMWA. The operators have very properly advised Lewis that they will not confer until the mines return to work. Meanwhile, many industries important to reconversion are faced with a diminishing supply of fuel and power.

Interference with coal supply, coupled with the threat of use of the large cross-country war emergency pipelines for transportation of natural gas, and the aggressive policy of oil producers in pressing distribution in the industrial and domestic markets, is recognized as a serious matter to the coal mining industry. Thorough understanding of this threat is evidenced by a letter recently addressed by President John Lewis to the UMWA membership in the anthracite region, calling upon anthracite miners to increase production to "meet post-war competition of oil and other fuels." The letter explained to the miners that anthracite markets have been enlarged during the war, bringing in hundreds of thousands of new consumers who had previously used oil, coke and other substitutes. The men were told that prices of fuel oil have already been reduced and that now increased production per day is largely the answer to the problem of continuity of employment and the maintenance of wage and working condition standards. "We must cooperate and work to the end," said Lewis, "that the present market for anthracite coal can be maintained and enlarged if possible. Increased daily production is necessary to bring about and hold this result."

St. Lawrence Project

In a special message to Congress on October 3 President Truman asked for quick approval of a joint resolution, introduced by Senator Barkley of Kentucky and Representative Sabath of Illinois, approving the agreement between the United States and Canada for the construction of the Great Lakes-St. Lawrence Seaway and Power Project. The resolutions, S. J. Res. 104 and H. J. Res. 248, were referred to the Senate Committee on Foreign Relations and the House Committee on Rivers and Harbors, respectively. A majority vote in each House is all that is required to authorize action on the agreement. The effort made last fall by Senator Aiken of Vermont to secure approval of the St. Lawrence project by amendment to the rivers and harbors bill was defeated, 56 to 25.

In his message the President stressed the importance of the project in opening the Great Lakes to ocean navigation and creating 2,200,000 h.p. of hydro-electric capacity, to be divided equally between the U. S. and Canada. Praising the development of the Tennessee and Columbia Rivers and the rivers in the Central Valley of California, he said that "one of the great constructive projects of the North American continent—in fact, one of the great projects of the world—which was delayed by the exigencies of war is the St. Lawrence Seaway and Power Project." He asserted that every engineering investigation during the past 50 years, every economic study in the past 25 years, have found the project feasible and economically desirable, and emphasized that "the case has been proved; the plans are ready." The President repeated that the water-power project should become the property of the State of New York, and that the electric power should be developed and handled by the State.

Lands Beneath Navigable Waters

Now awaiting action in the Senate Committee on Judiciary is Representative Hatton Sumners' (Dem., Tex.) bill, H. J. Res. 225, which would quiet state titles to tidewater lands and lands beneath navigable waters. On the floor of the House an amendment was placed in the measure to protect the right of mineral and corporate property land owners. In some states a question has been raised whether those who now hold titles under the established legal rule prevailing, are, in a legal sense, successors in interest of the state. Speaking in support of the amendment which had been offered by Representative Earl R. Lewis of Ohio, Rep-

(*Continued on page* 69)

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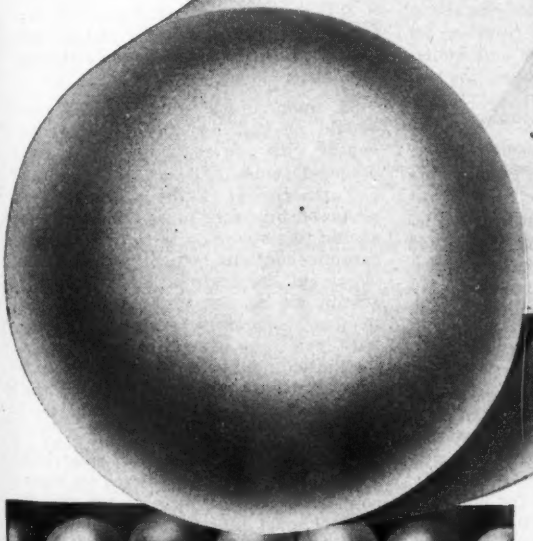

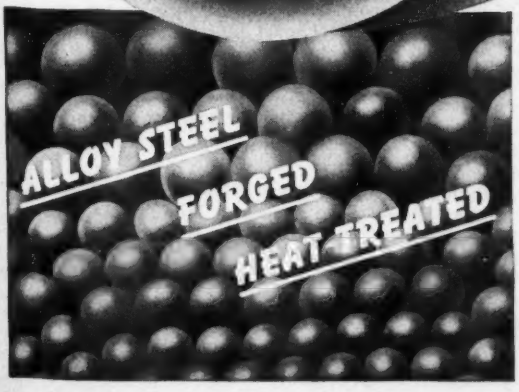

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American Mining Congress Outlines Needed Revision of the Revenue Act—

Tax Committee Presents Views to Congress in Following Letter:

To the Chairman and Members of the Committee on Ways and Means
House of Representatives
Washington, D. C.

GENTLEMEN:

We are glad your committee is proceeding definitely at this time with needed revision of the Revenue Act applicable to the postwar reconversion period. Our wartime revenue legislation needs revision not merely as to rates and nature of taxes but also demands revision, clarification and improvement in many of its substantive, technical and administrative provisions, action on which should not be long delayed.

We concur in the wisdom of your announced decision to limit present action to certain specific features of tax rates and particular taxes applicable to the year 1946 in order that such action may be promptly taken. Action on these features will help to give employers, investors and business organizations greater confidence to go ahead with reconversion, development and peacetime activities. We even concur in your decision to expedite action by not holding public hearings on the proposed bill.

In this spirit, we submit to you without extended argument a brief outline of action which we believe should now be taken, as follows:

1. *Repeal of Excess Profits Tax:*

It is most important that business and investors know promptly that the excess profits tax will not be effective for the post-war period so they can make their plans accordingly. This tax imposes a heavy penalty against profits in excess of a somewhat arbitrarily determined amount for any corporation. It was only justified as war emergency taxation. The continuation of this tax after the end of hostilities would stifle incentive and discourage industry from reaching the high levels of employment which the national welfare requires. We accordingly urge prompt passage of legislation which will terminate the excess profits tax as of December 31, 1945.

2. *Retention of Unused Excess Profits Credit:*

The unused excess profits credit carry-back should be continued so that such credits from the years 1946 and 1947 can be carried back as credits against the years 1944 and 1945. In adopting the extremely high rates of excess profits tax, the carry-back was recognized as an equitable allowance in computing the taxable income of the high-tax years. Moreover, the carry-back provisions were intended in some degree to give allowance in lieu of tax-free reserves for the deferred maintenance and underdevelopment prevalent during the war years. This two-year carry-back should not now be retroactively denied.

3. *Reduction in Rates of Income Tax on Corporations:*

We urge that the combined corporate normal and surtax for 1946 should not exceed 33 per cent, with further reductions to be made in subsequent years. We believe the present 40 per cent rate is too high to be maintained in peacetime without being a definite deterrent on business enterprise. This is particularly true where dividends are again taxable to stockholders. We believe the net effect of such a reduction will not be a loss of revenue; rather, by leaving greater incentive for business activity, development and employment it will tend to give increased revenues to the government.

4. *Individual Income Tax Rates:*

Since existing individual income tax rates virtually prohibit investment of risk capital, there should be a general revision of the individual income tax rate structure so that no individual will be subject to income tax liability in excess of 50 per cent of his taxable income. If such a revision of rates for 1946 is not practicable at this time, we urge a reduction of at least 20 per cent in all individual income taxes for 1946 with a general revision of rates thereafter applicable to 1947 and subsequent years.

5. *Taxation of Corporate Income Paid As Dividends:*

Against the tax on dividend payments to individuals from corporations which are subject to federal income tax, there should be allowed a credit at a rate at least equal to that of the normal tax plus the initial surtax.

The inter-corporate dividend tax should be eliminated.

6. *The capital stock tax and declared value excess-profits tax should be repealed.*
7. *The 2 per cent penalty on consolidated returns should be eliminated.*
8. *The present 1 per cent tax rate for federal old-age benefits should not be permitted to increase on January 1, 1946.*

If opportunity were offered, we should be glad to appear before or confer with you regarding these recommendations.

Furthermore, if the scope of the proposed bill were to be expanded we should like opportunity to present our recommendations on other subjects which call for early action. The only reason we do not urge these at the present moment is because we agree with you that prompt action within the limited field is more desirable than delay until the broader range of the tax problem can be more fully considered.

Our particular concern at this time is with respect to those taxes on business enterprise or investment which we feel must be promptly reduced to give incentive for expansion of business activity and employment. Accordingly, we have limited our recommendations here stated to the features we feel most immediately important to that end.

Respectfully submitted,

The American Mining Congress
HENRY B. FERNALD,
Chairman, Tax Committee.
JULIAN D. CONOVER,
Secretary.

October 2, 1945.

Personals

Allen H. Bearse, Jr., New England manager of The Anthracite Industries, Inc., for the past four years,

has resigned to take over management of the solid fuels division of the Barrows Coal Co., Brattleboro, Vt. His resignation became effective August 31.

A complete mine safety program in Chile, S. A., for the Braden Copper Company, located near Santiago, will be organized under the direction of **Orr Woodburn**, director of the Globe-Miami, Ariz., mine rescue station for the past 30 years.

The project will be accomplished largely in September, October and November. The Braden company is an affiliate of the Kennecott Copper Company, a U. S. firm, and employs approximately 5,000 men.

H. J. French has resigned as assistant director for raw materials and facilities of the steel division, War Production Board, at Washington, D. C., and has resumed his duties as assistant manager of the development and research division of The International Nickel Company, Inc., at New York.

Mr. French joined the iron and steel branch of the War Production Board late in February, 1942.

N. W. Rice was recently reelected president and chairman of the board of the U. S. Smelting, Refining and Mining Company. **C. F. Moore**, who recently retired as vice president and consulting engineer, will remain with the company in a consulting capacity.

Paul M. Tyler, one-time Eastern Regional Engineer of the U. S. Bureau of Mines, has been appointed European Representative of the Foreign Economic Administration. He will be headquartered in London, England, in connection with the work of its Technical Industrial Intelligence Subcommittee on Metals and Minerals.

Harry C. Lee, until recently in charge of the technical department of Basic Magnesium, Inc., has returned to Basic Refractories, Inc., as vice president and technical director.

F. P. Reinhard has accepted a position as superintendent of the Lillybrook Coal Company's new mine at Abney, W. Va. He was formerly superintendent and chief engineer of the Tioga Coal Corporation, Tioga, W. Va., and mining engineer for the Nicholas Webster Coal Corporation, Ticoal, W. Va.

Dean Millman of Nashwauk, Minn., was recently promoted to the position of chief engineer of the Wisconsin Steel mines on the Mesabi iron range. He succeeds **E. L. Bemis**, who has been made assistant general superintendent of the company mines.

John Furlong, assistant mine foreman, Westland mine of the Pittsburgh Coal Company, and **Clarence Taylor**, assistant mine foreman, Montour No. 4 mine, have been appointed safety inspectors. **Lawrence Martin**, loader operator at the Westland mine, has been made a fire boss at the Westland. **C. S. Parisi**, assistant engineer of Somers mine, has been transferred to Banning No. 1 as assistant engineer.

After serving for 30 years with the Phelps Dodge Corporation at its Burro Mountain Branch, Tyrone, as cashier, agent in charge of the property, and since the war as superintendent of its extensive leaching operations, **Philip R. Lynch** retired at his own request July 1, according to an announcement made by H. M. Lavender, general manager of Phelps Dodge properties and operations in New Mexico and Arizona. He has been succeeded by **E. C. Peterson**, formerly in the purchasing department of the corporation at Douglas, Ariz.

Major Jerome C. White, U. S. A., formerly with the Monroe Coal Mining Company, Ebensburg, Pa., is with the American Army of Occupation in Germany as chief of the Economics Section of the Regierungsbezirk Military Government Detachment. Major White will assist in the rehabilitation of the industries of that area to provide minimum essential needs for the German civilian population and to create a surplus to be placed at the disposal of the armed forces.

James Douglas, Deputy Vice Chairman for Metals and Minerals, has resigned from WPB to become affiliated with the Phelps-Dodge Corporation in New York. Douglas became associated with the Copper and Zinc Branch of the Office of Production Management (WPB) in 1941 and has played a major role in the stimulation of production in the field of metals and minerals during the war. He participated in the development of Order P-56 and in the organization of the Mining Division. Prior to entering the service of the Government, he operated several mines in California and previously had wide experience in Mexico, Peru and South Africa.

Col. Robert P. Koenig, head of the Solid Fuels Section of SHAEF and in charge of and responsible for the coal and mineral production of the various conquered and liberated countries of Europe, recently was decorated with the Order of the British Empire by Air Marshal **Arthur Tedder** of the British Army, assistant commander of SHAEF at Frankfurt, Germany. Col. Koenig is president of the Ayrshire Colliers Corporation.

Paul F. Kohlhaas has been appointed vice president in charge of engineering of Columbia Steel Co., according to **William A. Ross**, president. He assumed a prominent part in the building of the Japanese steel mills at Yawata, Japan and Anshan, Manchuria and his participation in these projects later proved a valuable asset to the Army and Navy in plotting bombing operations against Nippon's industrial areas.

Joseph A. Mecia, chief engineer and geologist for Bradley Mining Company's Yellow Pine mine, has been made manager of the Ima mine at Paterson, Idaho.

Effective September 1 **F. Witcher McCullough**, formerly assistant to the vice president, The Chesapeake and Ohio Railway Company, was appointed assistant to the president. His headquarters will remain at Huntington, W. Va.

C. C. Austin, general manager of the Mancha Division, Goodman Manufacturing Co., recently returned to Chicago after an eight-months trip through Central and South America.

J. Murray Riddell, mine manager of the Minnesota division of the E. J. Longyear Co., became professor and head of the mining engineering department of the Michigan College of Mining and Technology on Septem-

ber 26. At the same time the civil engineering department headship was assumed by **W. C. Polkinghorne**, who two decades ago was assistant superintendent of the Ahmeek Mining Co., before joining the MCMT staff. The new department of engineering administration will be headed by Associate Professor **E. J. Townsend**, who holds bachelor and masters degrees in mining engineering from MCMT.

After graduating from the Michigan College of Mines in 1911 and serving briefly as an instructor there, Mr. Riddell worked for several Michigan copper mines. He then joined the staff of Oglebay, Norton & Co., as chief engineer in the Krivoi Rog district of Russia.

He next held responsible executive positions with the Corrigan, McKinney Steel Co. and the Republic Steel Corp. In addition he has engaged in consulting work and has carried on individual independent research on mining problems in the Steep Rock district of the Atikokan Iron Range of Western Ontario. In 1940, he went to the Longyear Co.

Edward Thornton and **B. M. Snyder** are now associated in the Union Engineering Company, mining and metallurgical engineers, in Los Angeles. They have recently been active in the development of vanadium and uranium ores near Dove Creek, Colo. Mr. Thornton was formerly General Manager of Summitville Consolidated Mines, Inc., at Summitville, Colo., and was president of the Colorado Mining Association in 1942.

The Anthracite Industries, Inc., has announced appointment of **Emmett Mulroy** as field representative with headquarters in Syracuse to cover the territory formerly covered by the late **Edward G. Freidell.**

John L. Auch, comptroller of the Pittsburgh Coal Company, has been elected a director of the Pittsburgh Control of the Controllers Institute of America.

The Triumph mine at **Hailey, Idaho**, the largest mine in the state outside of the Coeur d'Alene district has appointed **A. H. Shoemaker** as general mine superintendent, replacing **A. M. Jensen**, who resigned to take charge of the adjoining Snoose mine, of which he is one of the owners.

Effective September 1, **Ira F. Davis**, formerly engineer of coal properties, The Chesapeake and Ohio Railway Company, is appointed assistant vice president. He will have general supervision over coal-mine development. His headquarters will remain at Huntington, W. Va. **Dr. Charles E. Lawall**, formerly president of West Virginia University, is appointed engineer of coal properties, succeeding Mr. Davis, according to announcement by **Walter J. Tuohy**, vice president.

Frank J. Laskey, general purchasing agent of Republic Steel Corp., has been named manager of purchases and raw materials according to President **Charles M. White.**

John W. Crawford, secretary-manager of the DeBardeleben Coal Corporation, has been chosen a director of the Birmingham Control.

— *Obituaries* —

Francis O. Wyse, 48, who has been publicity manager of the Bucyrus-Erie Co., South Milwaukee, Wis., for 19 years, died September 15 in Milwaukee following a lengthy illness. He was born in Salem, Mass., and received the degree of mechanical engineer from Massachusetts Institute of Technology in 1919.

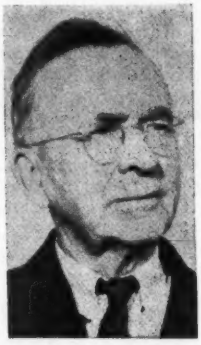
Walter Henry Walsh, 45, Federal coal mine inspector, was killed in a mine cave-in at the Glen Echo mine of the West Coast Mines, Inc., near Bellingham, Wash., on July 21. Mr. Walsh was assisting a mine foreman in supervising the driving of a tunnel through a previous cave-in, when a second fall of 300 to 400 tons of rock occurred, killing both men.

Max Krom, who was a mining engineer with Balatoc Mining Company in the Philippines when the war started, and who was with the U. S. Engineers on Corregidor when captured by the Japanese, is reported to have lost his life on a Japanese prison ship which was sunk on October 24, 1944. He is the son of Archie Krom, president and western manager for West Coast Machinery Co., Seattle, Wash.

Col. O. B. Perry, 69, commander of the 27th Engineers in the first world war and a well-known consulting mining engineer and dredge operator, died in San Francisco, Calif., on July 24. Death came as a result of shock and asphyxiation suffered while trying to extinguish a fire in his cottage on the Family Club Farm, near Woodside, Calif.

Burrell R. Hatcher, 60, formerly associated with the American Mining and Smelting Company, died July 26 at Tucson, Ariz. He was born at Prescott and was a graduate of the University of Arizona in mining engineering. He retired a few years ago after serving 21 years with American Smelting and Refining Co.

John R. Hickey, president of the Moorlight Mining Company, died at his ranch home near Philipsburg, Mont., on September 30, at the age of 69. Son of a pioneer Montana fam-



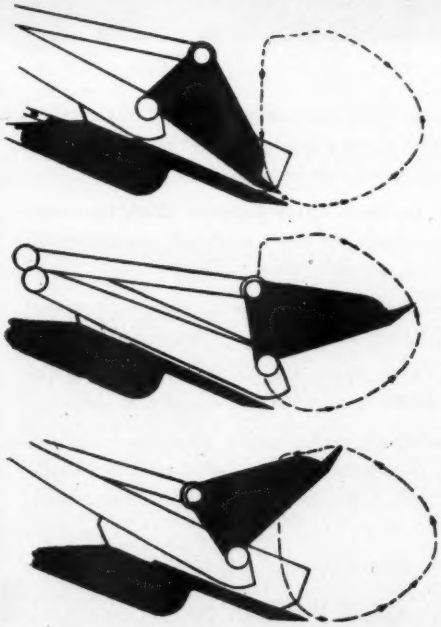
ily, Mr. Hickey had been active in the mining industry since 1916. He was vice president of the Mining Association of Montana from 1941 to 1943, and president from 1943 to January, 1945.

Frank Benane, pioneer Nevada mine operator, died July 10 at Martinez, Calif. With his brother Edward, he was active in the early development at Jarbidge, Gold Circle, and Mountain City. In recent years he had been employed by Basic Magnesium, Inc., at Gabbs, Nevada.

Justus R. O'Brien, 55, vice president of the Ingersoll-Rand Company in New York, died August 9 in New York City.

After being with Crane Co. for 53 years, **John B. Berryman**, chairman of its Board of Directors since 1935, died in Chicago on Friday, August 10, at the age of 83.

In 1911, he became secretary of the company and the following year, upon the death of R. T. Crane, the founder, he was elected a director and third vice president. In 1914 he became first vice president and president in 1932.



The Loader with the Exclusive Vertical Loading Action.

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• Do you pause now and then to think of Old Friends? Those old friends who wear so well . . . friends who can be depended upon when the going is tough? When you do, let it remind you of the Whaley "Automat", for, like old friends, the "Automat" is the long life machine . . . wears well, and you can depend on it when the going is tough.

Today, Whaley "Automats", eight, ten and twelve years old, are still leading tonnage producers. The "Automat" is recognized as a fast, dependable coal loader. But, it is so designed and constructed that it will take the punishment of heavy rock work. Ask any man who operates Whaley "Automats" and other types of loaders what machine he uses in the tough places and the answer is always the same—the Whaley "Automat."

If you are thinking of mechanizing your mines, remember the WHALEY "AUTOMAT" can load any lump of coal that can pass through your tipple or any size rock your cars, larries or aerial tram can take. Please mention your conditions when writing for data on machines.

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NEWS and VIEWS

There's no place like home. A gradual transition from the "coal towns" of 50-75 years ago has been taking place. Shown are some of the one acre farms of miners at Abbs Valley, W. Va.

Hamilton Wright Photo

Eastern States

Distinguished Service "S" Pennant

The Russellton Mine of Republic Steel Corporation, Russellton, Pa., on August 19, became the first coal mine in the United States to unfurl the National Safety Council's distinguished service "S" pennant for an outstanding safety record.

The pennant and certificate were presented for piling up 1,163,814 man hours of war production work from March 2, 1944 to April 9, 1945 without a disabling accident causing an employe to lose time on the job. During this period 841,972 tons of coal, equivalent to 14,000 loaded railway cars, were produced.

Both awards were presented to J. A. Cox, superintendent of the Russellton Mine by John Roche, council's industrial division director, at ceremonies held on the mine office lawn before a crowd of more than 500 persons including guests, mine employes and citizens of the community.

In presenting the green pennant, bearing a white cross, symbol of safety, Mr. Roche said, "When we come here to take off our hats to a mine that can operate more than a year without a single disabling injury, you can be sure that you have done something. Such a record as yours speaks of several things—of careful planning to make the mine a safe place in which to work and of fine cooperation in eliminating unsafe practices. Management can set up the machinery for a safety program, but only constant vigilance on everyone's part makes safety a vital factor in everyday operation.

"Many of you within the sound of my voice are here and on the job who otherwise would now be working with physical handicaps, would be in hospitals or convalescing at home, living out the rest of your years as unemployably disabled or would be out of the affairs of this world for good.

"Your record tells how completely you are sold on safety and 100 percent of you are entitled to credit for a job well done."

Other speakers on the program were Garfield Thomas, deputy secretary, Pennsylvania Department of Mines; George S. McCaa, Pennsylvania State mine inspector; John Zahradnick, District Board member, UMWA; George W. Grove, supervising engineer, U. S. Bureau of Mines; J. L. Hamilton, district manager, Republic's northern coal mines; E. B. Winning, assistant to vice president in charge of operations; and R. H. Ferguson, manager of safety, Republic Steel Corporation.

The "S" award and certificate have been presented to less than one hundred industrial units in the United

States. This is the third Republic unit to be honored, the other two being the Berger Manufacturing Division at Canton and the Bolt & Nut Division at Cleveland.

Want Anthracite Regulations Removed

Lifting of all government regulations on the distribution of anthracite coal because of improved supply outlook and lessened demand since V-J Day was recommended to Solid Fuels Administrator Harold L. Ickes September 12 by anthracite producers. The recommendation was contained in a telegram to Mr. Ickes from F. W. Earnest, Jr., executive director of Anthracite Institute.

The telegram follows:

"Directors of Anthracite Institute, representing 75 percent of the tonnage of the anthracite industry unanimously recommend, in the public interest, the immediate removal of all regulations affecting the distribution of anthracite. The industry is ready to assume full responsibility for supply to its customers and is confident their needs can be met this winter without the necessity for regulation."

An increasing supply of anthracite will be available to consumers this fall and winter, Mr. Earnest said in explaining the industry's position. Major reasons for the improvement are: the return of war servicemen to the mines, lessened demand of anthracite for wartime purposes, and increasing availability of improved machinery for the mines.

Lehigh Valley Coal Company Training Program

To relieve the manpower shortage and bring younger men into the anthracite industry, the Lehigh Valley Coal Company has started a training program for prospective mine workers.

Applicants, who must be 18 years of age or older, will receive standard wages for the training period of 26 days, a total of $225.25, and will be eligible for the $75 vacation pay which regular employes receive.

The trainees will be put in Dorrance, Franklin, Prospect, Henry and Westmoreland collieries. Mine foremen and safety engineers will acquaint them with the routine work and point out the worth of mining as a career. At the end of the course, each trainee will be eligible for the post of contract miner's helper.

The War Manpower Commission and the United States Employment Service are cooperating with the company in the venture.

In Wyoming Valley alone, 8,700 mine workers are needed and the entire industry could absorb at least 12,000, according to estimates. The local office of the United States Employment Service reports 3,000 male applicants for work registered.

Hamilton Wright Photo

Storage and handling of timber at Mine No. 34, Bishop, W. Va.

Association Honors Venerable Member

The Pocahontas Operators Association, through its resident members of its executive committee, Messrs. William Beury, vice president; Henry F. Warden, treasurer; H. C. Faust, R. C. Luther and W. E. E. Koepler, secretary, presented its past president, Mr. John J. Lincoln, of Elkhorn, with a very handsome watch and chain suitably in-

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scribed, in recognition of his long connection with the association.

For 43 years, beginning in the spring of 1902, Mr. Lincoln has occupied one office or another with the association. He was a founder and first secretary of the association, of which there have been only two. He was secretary from 1902 until 1918. Thereafter he became a member of the executive committee, treasurer, president from 1932 to 1945, and is now chairman of the executive committee.

The men called on Mr. Lincoln at his home September 5, at 11 o'clock, and found him in excellent health and in his usual cheerful spirit. They expressed the appreciation of the operators, literally thousands of miners and the public generally throughout the State for the invaluable public service which Mr. Lincoln has rendered for over 50 years, during all of which he has lived in the Pocahontas coal field.

Service Awards at T.C.I. & R.R.Co.

The Tennessee Coal, Iron & R. R. Co. have recently awarded Certificates of Service to 161 of their employes, totaling 4,400 years of service. Heading the list were four who had earned their 40-year service awards. They were—R. T. Young, of the General Office; Joe Corretti and Charles E. Griffith, both of the Fairfield Steel Works, and Louis W. Butts, of the Rail Transportation Department. Twenty employes received 35-year awards, 26 for 30 years of service, and 111 for 25-year certificates.

Fire Halts Furnace Operation

Fire in the engine room of the Sloss-Sheffield Steel & Iron Company's two city furnaces, located within the city limits of Birmingham, caused a shut-down of both stacks recently. There was considerable damage done to the machinery which will require some time to get the repairs made and the furnaces back in production.

Plans For Valley Creek Canal

For a number of years there has been a movement on foot looking towards the opening of a canal, known as The Valley Creek Canal, to connect the industrial district of Bessemer with the Warrior River. The idea is to use it for commercial shipping in connection with the barge line now operating on the Warrior. Recently a hearing before U. S. Army engineers was held in Bessemer at which a number of committee reports, with information and data on the subject, was submitted.

There is a possibility of the canal's construction in the near future, as it has a number of strong points in its favor and it has some influential backing.

Carolina Ilmenite

Commercial quantities of ilmenite are being taken out in the Yadkin River valley near Lenoir, N. C. Dr. J. L. Stuckey, State geologist, Department of Conservation and Development, said recently that approximately 100 tons of the mineral is being recovered per day by the Yadkin Valley Ilmenite Co., a division of the Glidden Co., and is being concentrated at the company's plant at Finley, N. C.

Meantime, he said, the concern is core drilling to determine the course of the vein and the probable reserve supply. Preliminary drillings indicate that the mineral continues some distance down the side of the mountain.

The ilmenite now is being recovered through open face mining, but the drillings reveal the vein tends to dip faster than the slope and underground mining may be necessary in the future.

The New Kona Feldspar Mine and Mill

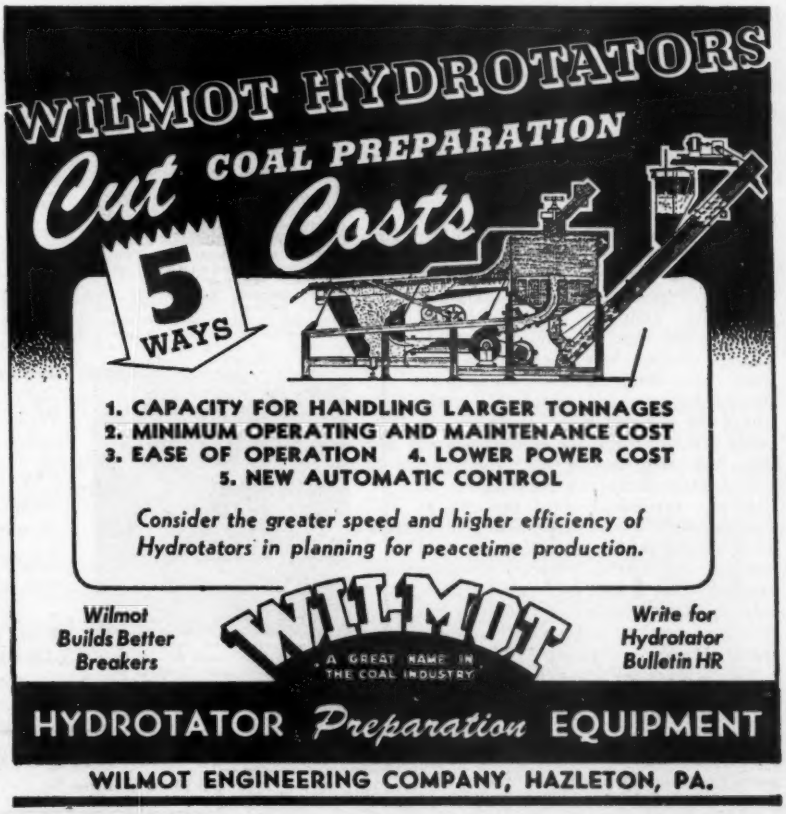
The Carolina Mineral Company has opened its new Kona plant at the confluence of the North and South Toe Rivers in Mitchell County.

It is reported to be the first commercial plant using the flotation method of concentrating feldspar. Previously, feldspar has been separated from the other minerals with which it occurs by laborious and inefficient hand-sorting. Kona will recover mica and quartz as byproducts.

Ore for the new plant is obtained from a pegmatite dike located just a few hundred feet from the mill, but purchase from other producers is contemplated.

Feldspar is an aluminum silicate containing varying amounts of soda and potash. It finds its way into chinaware, enamel ware, glass building blocks, window glass, electrical porcelain, radio and radar parts, etc. It is also an ingredient in many well-known brands of cleansers or scouring powder as a non-scratching abrasive.

R. W. Lawson of Erwin, Tenn., is president of the Consolidated Feldspar Corporation, which is the parent company of Carolina Mineral Company. Ed Boone of Spruce Pine is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general manager of the corporation and E. W. Koenig of Erwin is general superintendent.

Designing and construction of the kona plant has been under the direction of V. L. Mattson of Burnsville, who is chief engineer. T. C. Carson, Jr., is mill superintendent and chief chemist.

Store Machinery—Don't Scrap It

America's big guns and other heavy artillery equipment may be stored in hermetically-sealed containers instead of being scrapped at the close of World War II. In cooperation with the Pittsburgh Ordnance district, methods and procedures for this storage program are being developed by United States Steel's American Bridge Company.

Extensive research and experiments have been under way for several months in a section of the expansive Ambridge plant facilities. A welded steel container closely resembling the Army Quonset hut has been developed. The equipment after being stowed in these sealed-in units will be subjected to an inert gas atmosphere which (replacing the normal atmosphere with its corroding factors of oxygen and moisture) it is anticipated, will prevent deterioration of the contents over a long period of time.

Progress in Reconversion

IN ITS third round-up of reconversion facts and figures since Japanese surrender, the National Industrial Council has revealed a continuing trend of rapid rehiring after war contract cutbacks and indications of major peace-time job increases over pre-war totals.

Local, State and trade manufacturer associations have disclosed to the council unfilled jobs running up to several thousands in medium-sized industrial centers. While civilian goods production was indicated as in general closing the gap caused by contract cancellations, the nationwide survey revealed one spot, Colorado, where 35 percent more employes already are at work on civilian goods than had such jobs in 1937 and 1938.

The Manufacturers Association of Colorado estimated total lay-offs at 25,000, with everybody who wants work able to get it within a few weeks. Certain industries were reported "yelling their heads off" for workers, with much of the current idleness believed a case of war plant workers merely taking vacations.

The Industrial Council of Kansas City disclosed that 139 small firms employing 8,433 in 1939 are ready to put 13,335 at work in post-war jobs, an increase of 63 percent. Cutbacks were expected to affect not more than 20 percent of the labor force at most.

Jamestown, N. Y., revealed factory employment there totalling 13,533 now as against only 8,100 in 1939, and current needs at 161 more persons than worked in mid-August.

St. Paul lay-offs were estimated at 11,000, or less than 10 percent of that city's 145,000 total employed before surrender. According to the St. Paul Committee on Industrial Relations, reconversion strides have been rapid and the USES office in that city now has 4,800 jobs on file. A study made several months ago by a special local committee forecast a 21 percent increase above the 1940 employment total within a year after the end of the war, this figure including manufacturing, distribution, service, agriculture and other lines.

The construction industry in Minneapolis was reported to need men acutely and to be unable to fill its needs despite war plant lay-offs.

Montgomery County, Pa., was shown to have 168 firms with pre-war pay rolls of 31,520 estimating post-war employment at a minimum of 37,000. That would be within 2,000 of the surrender-day figure and approximately 16 percent above the pre-war total. The employment situation there should stabilize in a couple of weeks, it was reported.

Portland, Oreg., one of the nation's "bad" spots according to some claims, reported that the brick industry is down to 40 percent of capacity because of inability to get enough help and that at least one of the large pulp and paper mills is short of labor. The Oregon problem was declared to be in part a case of many who were employed in war plants being simply unable to handle the type of jobs available.

In order to speed re-employment and hurry civilian goods production, the Manufacturers Association of Hartford County, Conn., set up an employment bureau and began advertising in the principal newspapers of the county. The association cited that county's diversification in products and processes as protection against sharp seasonal fluctuations, declaring that workers laid off in one factory can quickly be absorbed in another provided contact can be brought about.

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This shows one of three Sauerman Scrapers used at an iron mine to store and reclaim different sizes of crushed tailing which is sold to contractors. Over 200,000 tons are handled each year.

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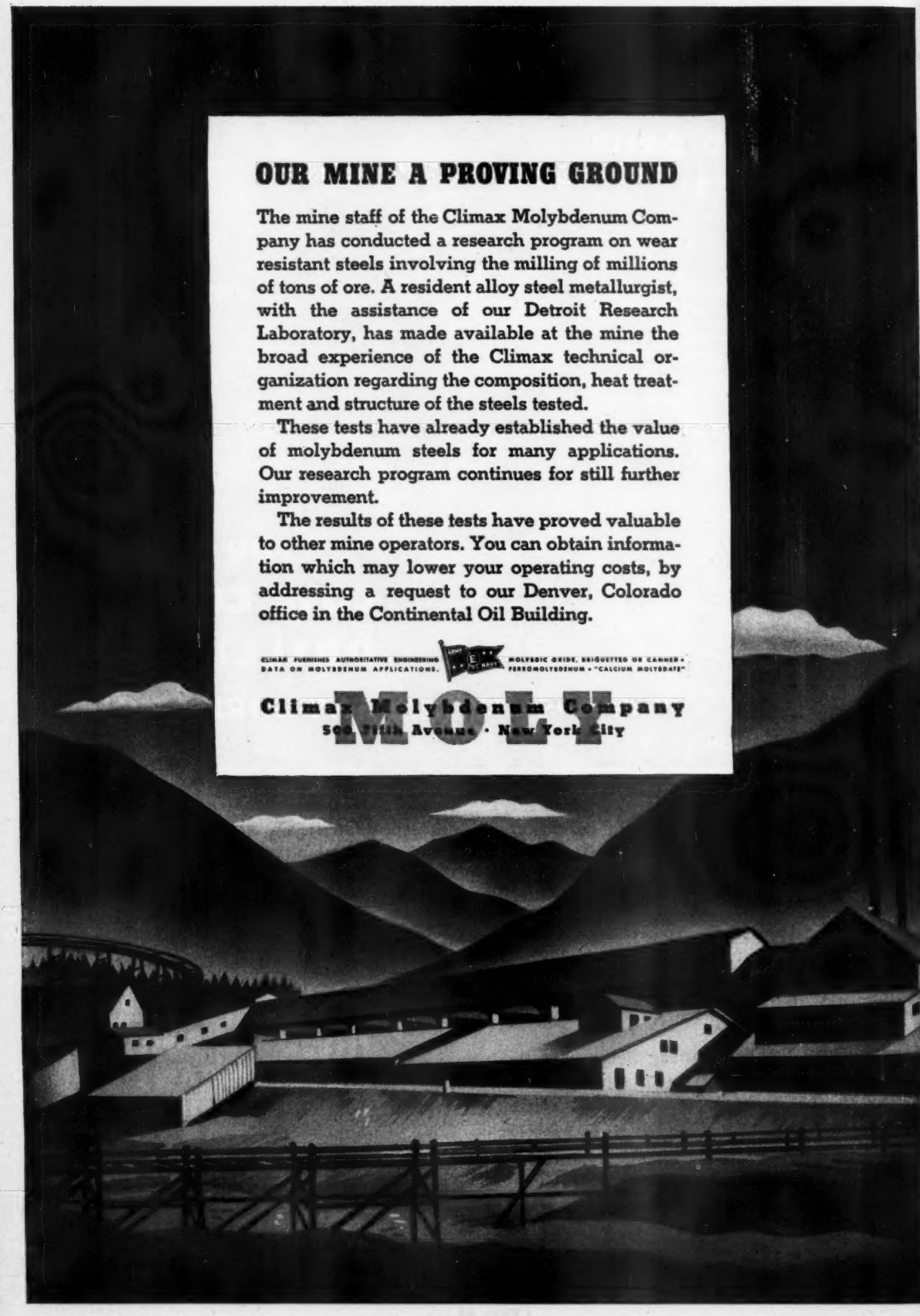
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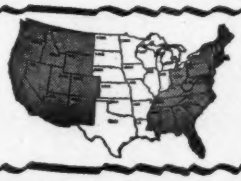

New Copper Products Plant

Start of work on an important industrial establishment has been announced by Wylie Brown, president of Phelps Dodge Copper Products Corporation.

Grading has begun, Mr. Brown said, on a site at Fort Wayne, Ind., where the copper company will erect a $4,500,000 rod, wire and cable plant to operate as a new division similar to its present Habirshaw Cable and Wire division, at Yonkers and Nepperhan, N. Y.; the Bayway division, at Bayway, N. J.; the Los Angeles Tube division at Los Angeles, Calif., and the Inca division at Fort Wayne.

The new plant will operate as a separate division, not as an addition to the magnet wire and coil plant of Inca division. It will be fully equipped for copper rod rolling and for wire drawing, stranding and insulating on a tonnage basis.

"This expansion of our permanent production facilities was decided upon," Mr. Brown said, "because of our certainty that peace will bring an increased demand for our products and will enable us better to serve the automobile, radio, electrical appliance, aviation and other industries, as well as the utilities of the great mid-Western area, that have extensive requirements for these products."

The new plant will occupy about 31 acres and, when in full production, will employ several thousand persons.

Production Line for Pre-fabricated Homes

Plans for construction of a million-dollar new plant at New Albany, Ind., for the production of prefabricated homes on a production-line basis were announced recently by Gunnison Homes, Inc. In making the announcement, Foster Gunnison, president of this United States Steel Corporation subsidiary, said that the new plant would have a capacity of 1,650 houses per year when operating on an 8-hour day. It is estimated the plant will be capable of producing 3,200 units on a double-turn basis.

"Millions of Americans enter the peacetime era with plans to own homes of their own, or a desire for home ownership which may well be realized in the near future," Mr. Gunnison said. "The prefabricated home industry has now assumed an important position in the housing field, and may be expected to supply a substantial part of this demand."

Ohio Village New Geographic Center of Steel

About one mile south of the little village of Dola in Hardin County, Ohio (population 175), lies the geographic center of the nation's steel industry, as determined by the American Iron and Steel Institute.

Dola, which is about 22 miles east of the city of Lima, is an agricultural community without any sign of a steel plant. Actually, the nearest furnaces are in Mansfield, about 60 miles to the east.

Dola's claim to fame is that it is the "center of gravity" of the steel industry, around which the nation's capacity for producing steel is evenly distributed on the "tons-times-miles" method of calculating.

Since 1940 the geographic center has moved west about 66 miles from a point about eight miles northeast of Mansfield, Ohio. Wartime-increased capacity in Western and Pacific Coast States re-established the westward trend of the steel industry which had been reversed during the thirties.

The center of steel capacity has moved westward an average of about 16½ miles per year since 1940, only about one-third as far as the average annual shift between 1874 and 1933.

The center shifted south approximately six miles during the war. Despite the general expansion of northern steel plants, the increased capacity of southern and southwestern plants slightly overbalanced the "tons-times-miles" factor of the northern plants.

From the beginning of the American steel industry along the Atlantic seaboard, the industry steadily gravitated westward until by 1933 the center reached a point near Crestline in Crawford County, Ohio.

During the period from 1874 to 1933 the industry's center shifted gradually from Juniata County in central Pennsylvania to Crawford County in north-central Ohio. The expansion of the Pittsburgh steelmaking area and the development of the Chicago area drove the geographic center in nearly a straight line westward, with practically no deviation north or south.

Additional capacity installed to the east of the center between 1933 and 1936 reversed the westward trend. The center retraced its path about 13 miles to the east. By 1940 the center had traveled eastward another four miles, or a total of 17 miles east of the point reached in 1933.

Wartime expansion halted the reversal; the center again moved west and spurted an additional 49 miles beyond its previous westernmost point to its present location near the Ohio village of Dola.

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Spoil Banks Ideal for Planting Trees

TREES grow better on the turned-over soil of strip-mined banks than on ordinary soil in the same neighborhood is the finding announced by Dr. I. P. Auten and Gus Limstrom of the U. S. Forestry Central States Experiment Station, Columbus, Ohio.

Dr. Auten and Mr. Limstrom have conducted a series of tests of the soil strip-mine banks and checked the experimental plantings made over the past several years by the Ohio Reclamation Association.

"Conditions are most favorable," Dr. Auten stated, "for a wide variety of trees."

Soil analyses showed the strip banks to be far superior to ordinary ground for tree growing, Dr. Auten declared. The deep plowing, result of strip-mining operations, placed new soil on the surface and leaves the whole aerated and loose. This, says Dr. Auten, makes for ideal tree growing conditions.

"The result of our own experiments conducted over a period of eight years and involving the planting of over 3,500,000 trees has been confirmed by Dr. Auten," declared Alan Davidson, president of the Ohio Reclamation Association, organized by companies engaged in the strip method of mining coal to reclaim the strip lands. "It is our intention to reforest this area as fast as the trees can be obtained."

Limstrom has been assigned by the U. S. Forestry Central States Experiment Station to remain in the area for the purpose of making soil analyses and recommending the types of trees best adapted to the soil conditions which occur. Charles MacIntire, acting director of the Ohio Reclamation Association, will work closely with Limstrom to coordinate the actual planting operations of the association with his findings.

C. & M. Moves Derrick and Hopper To St. Louis No. 4

The C. & M. Mining Company has about completed the moving of a wooden derrick and 450-ton hopper from the Scott lease to the No. 16 shaft on the old St. Louis Smelting and Refining Company's No. 4 lease, which is located a mile southeast of Hockerville.

The No. 16 shaft is a short distance west of the old St. Louis No. 4 mill shaft, which also is being operated by the C. & M. company. Mine operations are being carried on around the 215-foot level. The company will continue to truck its ore for custom treatment to the Ballard, or No. 8, mill of the St. Louis Smelting & Refining Company, a mile southwest of Baxter Springs.

Two of the 60 carloads of parts required to ship a Marion type 5561—35-cu. yd. coal stripping shovel to United Electric Coal Company operations at Peoria, Illinois

Homestake is Returning to Production

Homestake Mining Company is in its 69th year of operation, having consistently progressed without interruption of consequence until the shutdown by Federal edict in 1942. Needless to say this shutdown period has been a trying one for all concerned in this great gold mining enterprise, affecting as it has the dividends of thousands of stockholders, those who manage the company's affairs, and especially and more seriously, the miners and laborers who were forced to quit their jobs, break up their homes in Lead and seek employment elsewhere. The business and professional men and the concerns which had for so long depended upon the 7,500 population of the city for their livelihood were especially hard hit, but most survived. The Homestake gold mine has paid $106,771,058 in dividends in its 69 years of operations.

Now that this 2½-year blackout that has darkened Lead and the whole area has been lifted, the entire area affected is beginning to see bright streaks of sunshine and the optimism that prevailed through the 69 years of Homestake's operation is returning.

The gold is here awaiting the return of the miners who want to come back just as soon as they may be dismissed from their essential war work elsewhere, when Lead will fully come back to normal or better. In the past, regardless of conditions elsewhere throughout the nation, through panics and depressions, Lead has always moved along and ahead prosperously. That same condition will unquestionably prevail again and from near and far labor and others seeking security and prosperity will look to Lead and the Homestake for relief and contentment.

Present mine production at Homestake is about 600 tons daily and the management expects to increase this gradually until normal production has been restored.

The Homestake Mining Company and wholly-owned subsidiaries reports for the six months ended June 30, 1945, a net loss of $962,071, against a net loss of $525,049 in the like 1944 period.

10-yd. stripper at Truax-Traer Coal Company's Dakota Star Mine near Hazen, North Dakota

New Battery Plant

The National Battery Company has recently purchased approximately eight acres of land located near the intersection of Lexington Avenue and Hewitt Street in St. Paul. The land was purchased from the Northern Pacific Railroad adjoining the Great Northern tracks to assure adequate shipping facilities, as announced by A. H. Daggett, president. The company plans to put up a new modern building on this property as soon as construction costs are reasonably back to normal.

The company, with general offices in the First National Bank Building, St. Paul, has 12 manufacturing plants located at St. Paul, Leavenworth (Kansas), Chicago Heights, Depew (New York), North Bergen (New Jersey), Atlanta, Dallas, Los Angeles, Rock Island, Sioux City, Zanesville (Ohio) and Salem (Oregon). Headquarters of its industrial division are at Depew, N. Y.

Plans Powdered Iron Plant

The Range Resources Commission has approved expenditures of $300,000 for an experimental powdered iron plant to be built on the Mesabi Range. This project is one of the avenues for possible use of the enormous low-grade iron deposits of the state. Raw materials for the plant will consist of iron carbonate slate from which it is said to be possible to obtain an iron powder of great purity. This powder may be pressed and sintered into machine parts and tools of high strength. C. V. Firth of the University of Minnesoto School of Mines Experiment Station developed the process of making this iron powder. Reports state that the pilot plant will employ about 40 men and will be built on the eastern end of the Mesabi Range because of the presence there of ample supplies of iron carbonate slate. The Continental Machine Company of Minneapolis is expected to operate the pilot plant for the state during the testing period.

Slope at Truax Traer Coal Company's Wilton mine in North Dakota. Photo taken during construction of concrete portal. The Wilton mine was formerly a coal-strip operation

Magnet Cove Barite Operations Now Extensive

The Barite Sales Division of National Lead Company and the Magnet Cove Barium Corporation are producing more than 25,000 tons of processed oil well drilling mud monthly from the huge deposits of barite occurring near Magnet Cove, Ark. Plans are now under way and effort is being made to get the open pit fully prepared to allow for full production throughout the coming winter months. The Magnet Cove Barium Corporation has purchased a Sullivan H-22 diamond drill with a view to drilling its property thoroughly and thus gain needed information to prepare plans for future underground mining operations. O. J. Benston is general superintendent for the National Lead operations and Harry Brown is president and general manager of the Magnet Cove Barium Corporation.

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6" BLACK LIGHT WT.
STEEL
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Plain end for welding and grooved for Victaulic coupling.

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Weight—approximately 8 lbs. per ft. 35c per ft., carload lots. F.O.B. New Orleans, Louisiana

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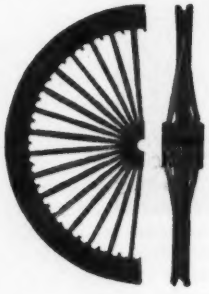
45° Dump Cage

Four point setting. In designing Holmes' all-steel cages, first consideration is given to proper distribution of the load, so that the weight is transmitted directly to the lower bail members.



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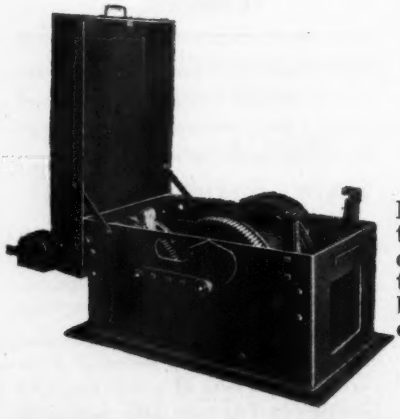

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DANVILLE, ILLINOIS

ALCOA Will Bid for Aluminum Plant

It has been announced that the Aluminum Company of America desires to take over the government-owned aluminum plants in Arkansas. The regional manager of the company's Arkansas operations made this announcement recently. He stated that the company would not acquire the huge Jones Mill aluminum plant unless it could also buy or lease the Hurricane Creek aluminum plant. Alcoa has been operating these $80,000,000 war plants for Defense Plant Corporation during the war. The company would buy the plants to continue their operation. Before the war, Alcoa shipped its Arkansas bauxite to plants in other states to be processed.

Mather Mine Enlarges Stockpile Ground

Arrangements are being made to enlarge the permanent stockpiles at the new Mather mine at Ishpeming, Mich. It will be necessary to change two of the nine holes of the Wawonowin golf course which will make room for at least a million tons of additional storage. Due to the scarcity of men and the preparatory work necessary to get the operation under way, production at the Mather mine has been low up to this time. With the conclusion of the war, however, the rate should increase rapidly until an anticipated production of 130,000 tons per month is reached. It is reported that sticky ore has been encountered, necessitating increase of the angle of the stor-

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age pocket chute plates and addition of air vibrators to the pocket sides to keep the ore moving.

"Book" Mine Development

Several changes and improvements have taken place recently at the Book mine near Crystal Falls, Mich. The operation has been changed over from open pit to underground and 4-ton skips have been installed operating in balance on a 30-degree incline. These dump into a pocket on the north bank of the pit where a 20-ton per hour crushing and concentrating plant has been built. Crude ore is hauled by Koering-Dumptor trucks from the skip pocket to the crusher pocket where it is reduced to ⅝-in. size by a 3-ft. cone crusher. Conveyor belts elevate the crushed ore to the top of the jig plant, where it is fed to Bendelari jigs. The concentrate is hauled by the same trucks to railroad cars and the jig tailings are stacked by belt conveyor in a pile north of the plant. Housing facilities have been built for the 150-h.p. electric hoist and two 500-cu.-ft.-per-minute electric driven air compressors, as well as a change room for the men.

Wheels of Government

(*Continued from page* 52)

resentative John R. Jennings of Tennessee stated that it strengthens the purposes of the bill, which he explained as being to "quiet forever the title of every state to submerged lands within its boundaries and the title of every city or every subdivision of a state, and of every corporation, firm or individual who has acquired title to the submerged land within the respective state."

Stockpiling

A definite administration consciousness of the necessity of stockpiling strategic metals, minerals and other materials for the national defense was evidenced in the President's message to Congress, in which he stated that "one of the costliest lessons of our unpreparedness for this war was the great danger involved in depending upon foreign sources for supplies of raw materials necessary in times of national emergency." Declaring that this country should never again permit itself to be in a position where its defense may be jeopardized by the fact that it has been cut off from the source of strategic raw materials, the President recommended that Congress enact legislation to bring about the acquisition and retention of stockpiles of materials in which we are naturally deficient, but which are necessary to supply the needs of the nation for its defense.

The Thomas-May bill, S. 752 and H. R. 2624, was introduced in March to provide sound stockpiling legislation. The War and Navy Departments are desirous of the enactment of a stockpiling statute, to supplement the Thomas Stockpiling Act approved June 7, 1939. Early action is necessary to replace the "stop-gap" Section 22, contained in the Surplus Property .Act of 1944, which will lapse on January 2, 1946.

Did You Know?

The coal used to produce coke and bituminous coal by-products last year would make a coal train extending all the way from New York to Tokyo and return.

* * *

All of the four and one-half million pounds of sulfa drugs produced in the United States last year came from coal by-products.

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PARMANCO Horizontal Drills are used exclusively in the Iron Range for horizontal drilling.

They are also used by a large percentage of the strip coal mines.

The new PARMANCO Vertical Drill has revolutionized test drilling.

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Western States

Future of Geneva Steel Plant

The big question mark in western industry is still what is going to happen to Geneva steel plant at Geneva, near Provo, Utah. Completed at a cost of approximately $190,000,000, the plant is now operating under instructions from the Reconstruction Finance Corporation at a reduced rate by the United States Steel Corporation. The plant has not yet been officially declared surplus property by the RFC but the Government agency has indicated that it is open for bids.

So far no official bids have been entered for the purchase of the plant. The Kaiser interests of California and the Colorado Fuel & Iron Company have indicated their intention of entering bids, while the United States Steel Corporation has decided it will take no further action toward its acquisition.

Deep Exploration of National Tunnel & Mines

A development program that is being watched with interest in Utah mining circles is being conducted at the property of the National Tunnel & Mines Company at Bingham.

A crosscut has been extended from the Apex property to the newly acquired Utah Metal & Tunnel property to prospect the A, B and C limestone beds at a depth of 3,100 ft. While some ore showings were encountered in previous work on upper levels at the Utah Metal & Tunnel, this is the first deep exploration in this particular section of the Bingham district.

Rehabilitation at Utah Copper

A $3,500,000 program of rehabilitation will be undertaken at the Utah Copper mine at Bingham in the near future, according to President D. D. Moffat.

The program is designed to "catch up" on work delayed during the war emergency because of the labor shortage and to replace worn out equipment. During the peak of war production Utah Copper broke all records, mining over 100,000 tons per day, compared to a peacetime record of 85,000 tons per day. The Bingham pit is reported to have yielded approximately 30 percent of the nation's domestic supply of copper during the war.

Shipments from Wasatch Mines

Several small shipments of lead-zinc ore have been made from the Wasatch Mines property situated in the Alta mining district, during the summer months. The ore was mined from a deposit discovered by lessors who have been working in the property for the past two years. Prior to that time the mine was idle for a number of years.

Colorado to Make Mine Survey

Wm. J. Schenler, chief engineer of the mining department of the Colorado Fuel & Iron Company and Arthur M. Lorenson of Silverton, Colo., are the new members appointed by Governor John C. Vivian of Colorado to the State mineral resources board. Clarence O. Withrow of Denver, J. Marvin Kleff of Leadville and Dr. M. F. Coolbaugh were reappointed to the board which has recently decided to cooperate with the U. S. Bureau of Mines, the Reclamation Service and the U. S. Geological Survey in employing Dr. John W. Vanderwilt, Jr., to direct a survey of the mineral resources of the State.

This work will involve the answering of a questionnaire which will be sent out either by Colorado Mining Association or the U. S. Bureau of Mines. It was originally planned to have this work done by the U. S. Bureau of Mines but the end of the war and the cutting of appropriations may require a change in the plans. The results of the work will be published in booklet form for distribution throughout the United States.

Montana's Mining Aid Program

Work is reported well under way on the new two-year program of the Montana Bureau of Mines and Geology. This will bring aid to small mining enterprises, enlarge the scope of aid to farmers in developing Montana's ground water resources, and it is hoped, complete a geological program, bearing on the search for new ore deposits in sedimentary rocks. A $25,000 appropriation was granted by the last legislature and will be continued for two years.

Geological reports will be made on the Marysville, Bryant (Hecla), upper Blackfoot River, Independence and related areas in Park and Sweet Grass counties and the report of the Butte Highlands district will be completed.

Dr. Eugene S. Perry, chief geologist, assisted by Thor Karlstrom, is making a progressive study of nonmetallic mineral deposits. He is also in charge of the ground water survey of the State and has been of direct assistance to many farmers in northern and eastern Montana in locating wells. Five memoirs and five miscellaneous papers on ground water in Montana have been published by the bureau.

To meet the demand for information on Montana placers which is antici-

Leadville, Colorado, around which has centered so much of the past and present mining activity in the high state

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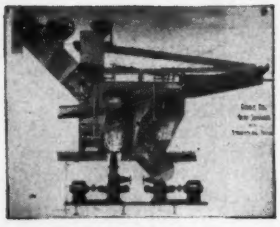

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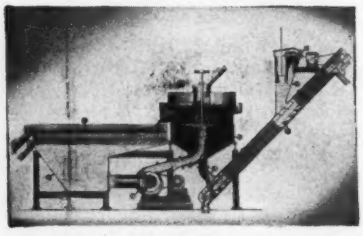

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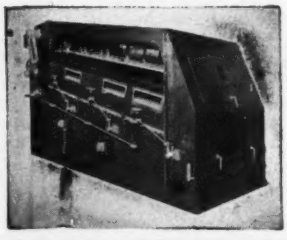
This is the effective way to wash fine coal and get increased recovery of marketable coal from sludge and refuse. Low cost efficiency is built into the Hydrotator.



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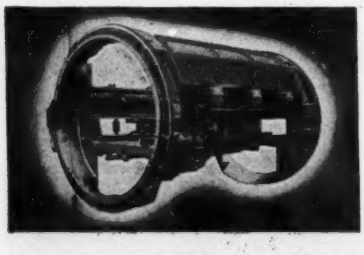

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pated with the end of the war, it is planned to produce a map showing the lode gold districts and the drainage from those districts which may yield placer gold; another map showing the distribution and extent of possible gold bearing gravels; classification of all known Montana placers as to type of operation, general description of each placer district, investigation of possible buried placers in Alder gulch, description of the placer gold deposits in Yellowstone and Big Horn rivers and in the Gravelly range.

Dr. L. L. Sloss is continuing the surface and sub-surface studies of Mississippian and Devonian strata in Montana, analyzing the oil and gas production possibilities of these strata. Working with Dr. Sloss is Dr. Wilson M. Laird, on leave from North Dakota geological survey, to represent the United States geological survey on this work.

Professor O. A. Dingman will conduct the "Aid to Prospectors" program. He will travel about the State giving aid and advice on placer and lode mining problems, without cost, to those prospectors and small mine operators who are not yet in a position to employ technical aid.

Dr. S. R. B. Cooke is in charge of the bureau's mineral dressing research. He will work on methods of beneficiating certain metallic and nonmetallic ores of Montana, which will parallel the geologic work on the deposits. In addition he will work with Professor Dingman on the "Aid to Prospectors," offering assistance to small operators in the solution of their milling problems.

Coeur d'Alene Shaft Completed to 2,400 Level

IDAHO

The Coeur d'Alene Mines company has completed its main shaft from the 2,200 to the 2,400 level and is now engaged in cutting a sump and ship pockets below the level preparatory to cross-cutting to a rich silver vein discovered and prospected on the 2,200 level. This new vein is only about 200 ft. from the shaft. The main objective of the shaft is the 2,800-ft. level, from where a 1,000-ft. cross-cut will be driven to another vein which has been highly productive on the upper levels.

Tailings at 3,000 Tons Per Day

Every old mine dump and river deposit of tailings in the Coeur d'Alene district has been worked to the limit during the war for lead and zinc values. This has been made possible by the Government premium payments on both lead and zinc. The de-

posits would not be profitable under ordinary conditions. The largest operation of the kind in the district is by the Hecla Mining company at Osburn, west of Wallace, where a 3,000,000-ton deposit of tailings is being handled in four concentrating mills at the rate of 3,000 tons per day.

Idaho Second Largest Lead Producer

The United States Bureau of Mines names Missouri as the largest lead-producing State in the Union, with Idaho running a close second. Missouri has maintained this record for 37 consecutive years. The State's production in 1944 totaled 174,343 tons of recoverable lead, valued at $27,949,280. The State also attained ninth place among the zinc-producing States, making 36,626 tons of recoverable zinc, valued at $8,350,728.

The Federal Mining & Smelting company of the Coeur d'Alene district in Idaho is one of the large operators in the Tri-State field, which includes Missouri, Kansas and Oklahoma. This company owns 12 mines in the field, including the Duneweg, Granby-McColgin, Granby-Davis and Granby-American mines in Missouri; the Howe, Quapaw-Davenport, Lucky Syndicate, Lucky Bill and Gordon mines in Oklahoma and the Muncie, Tar Creek and Semple mines in Kansas. In 1944 these 12 mines produced profits of $404,584.03, according to the company's annual report. This compares with the company's operations in the Coeur d'Alene district, where its Page mine at Kellogg produced during the same year $787,-918.84; its Morning mine at Mullan, $370,870.69 and its Frisco mine at Gem, $111,001.38, making a total profit of $1,269,790.91.

Vindicator Plans Development

The Vindicator Syndicate Mining Company, which recently purchased a group of claims east of the rich Lucky Friday mine at Mullan, has cleaned out and retimbered old workings driven by the former owners, consisting of about 1,200 ft. of lower workings, and is making extensive preparations to continue the development. The object is to gain greater depth on an exceptionally good showing of silver-lead ore in a shear zone vein system. W. J. Largus & Company of Seattle is financing the development.

Changes at Merger Mines

Merger Mines Corporation, owning a large block of ground south of the Coeur d'Alene mines property, has changed management by electing J. V. Grismer and John B. Nelson to the board of directors in place of Morris Pearson and Alvin Collins. Grismer, who is mine superintendent for the Callahan Consolidated in this district, is to be the new manager for Merger. The Merger company has developed an important lead-silver vein at 1,400-ft. depth but, up to date, has done only prospect work on the showing. The property is being worked through the Coeur d'Alene mines shaft.

Award Contract for Cross-cut Work

The Metropolitan Mining Company, operating through the Sunshine Mining Company workings on the 3,100-ft. level, has awarded a contract to James Doyle, of Wallace, for 300 ft. of crosscut work, extending prospective development that has already opened the Yankee Girl vein, which is owned by Sunshine. Because of extralateral rights questions Sunshine has agreed to pay Metropolitan 17½ percent of the net profits from this ore body, which has been developed for upwards of 800 ft. in length. No production from this ore body has so far been attempted because of the manpower shortage and because the values are largely in silver.

Tamping Bags Give Better Results In Many Ways . . .

Comparative tests by many mining companies have proved that by using bags—SEALTITE BAGS—a better tamp can be made easier and quicker than by using the old "bug dust—catch as catch can" method.

With a better tamp they get more safety—less fumes and smoke and less blown-out shots. The amount of explosive can be reduced and still bring down more coal per shot.

It's important to have uniformly sized bags—as near the bore hole size as possible as it gives a tighter tamp and prevents shots from blowing out. All SEALTITE bags are exact in size.

Have your company make a test. We will furnish the samples FREE. Write for them today.

Pinal County Developments

New operations have been launched at the Dos Amigos mining property 12 miles south of Coolidge in Pinal County. The silver-lead ore from the operation will be sent to the El Paso, Tex., smelters.

The Troy Mining Company, to operate in the Pinal County Riverside district near Kelvin, has been approved by the Arizona Corporation Commission. Principal officials of the new corporation are Harry R. Scott and William Kirtland, Globe, and John W. Corbin, Phoenix.

Copper Properties Show Increased Profits

Earnings for the first six months of 1945 were an increase over a similar period in 1944, as announced by the Calumet and Hecla Consolidated Company and subsidiaries and the Inspiration Consolidated Copper Company, both having Arizona properties. Calumet and Hecla showed a $234,256 increase in net income for the six-month period ending June 30, and the Inspiration Company reported an increase of $400,531. The Hecla Company showed a profit of 10 cents per share above that of a year ago, and Inspiration showed 84 cents.

Placer Mine Operating at Rabbit Hole

A recent report from Lovelock, Nev., states that the operation of a placer gold mining plant was commenced recently at Barrell Springs in the Rabbit Hole region. The operation is expected by local authorities to lead in the general gold mining step-up of activity which can now be expected in Pershing County and which should get well under way just as soon as men and materials become available.

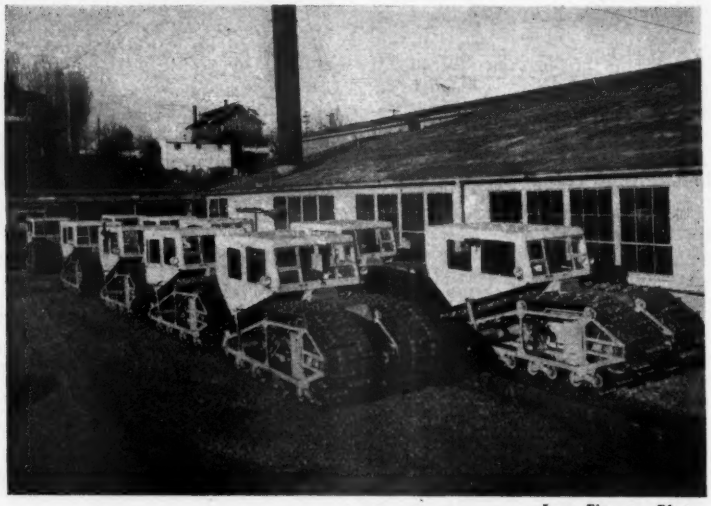
At the Barrell Springs operation, it is said that a tumbler system and washing process are to be used in recovery. Gravel is being dug by a ½-yard shovel which loads into trucks. The two trucks in use carry the gravel to the centrally located plant. Water is said to be present in sufficient quantity and experienced shovel men are reported to have been employed.

Operations Near Crown King

Rehabilitation of the south tunnel of the Lincoln mine has been completed by E. M. Moores, Jr. The tunnel, started some years ago to tap known ore bodies previously worked in the oxidized zone, is now in 500 ft. and another 1,000 ft. must be driven. Tunneling will start as soon as possible. Mr. Moores operates under bond and lease from Charles C. Miller, Jr., of Phoenix, who is trustee for the owners.

The Mohawk mine, about 10 miles from Crown King, is having an access road constructed preparatory to mining operations. The Mohawk is comprised of five patented lode gold claims — the Mohawk, Pittsburgh, Oulplaus, Midway and Hudson—and two mill site claims. $10,000 in gold production has been credited to this property, last operated in the 1920's. Although extensive development work was done by former operators, when C. H. Manly of Crown King took over last year, only the 200-ft. north tunnel was accessible.

Snow Cruisers May Solve Many Winter Problems



Iron Fireman Photo

A MATTER of interest to mine operators who yearly face heavy snow hindrances, is the snow cruiser in use by the Army Air Corps for search and rescue work in snow-bound areas.

Although the snow cruisers have been built exclusively for the Air Corps, they appear to indicate new advantages in freighting of supplies and personnel, particularly to mining and logging camps and to trappers in the world's snow countries, as well as for use in the maintenance of power transmission lines, over snowy mountainous areas.

The light weight, wide-treaded tractor is reported to be capable of transporting as much as 4,000 lbs. in deep snow and up steep grades as high as 35 degrees. It is now operating with the Air Corps search and rescue crews, salvaging planes, rescuing personnel and hauling supplies in Arctic regions heretofore onlv accessible by dog teams. Built of four component parts—two tracks, power section and cab—the tractor may be readily dismantled for transportation by plane. A removable aluminum and steel cab allows the tractor to be driven directly into the fuselage of the larger transport planes.

Tests made in Nome, Alaska, and with ski troops in Colorado have proved the machine is capable of traveling 18 miles an hour under average conditions and two miles an hour under difficult snow conditions and steep grades. An especially wide track system with broad footing area has been provided to prevent sinking in the deepest snow. In areas where the snow is as much as 50 ft. deep, the cruiser in action does not sink beyond operating level. A low center of gravity is an important feature of the design to prevent tipping on steep side hills. The deep grousers can produce tractive effort even in "powder snow."

The snow cruiser cabs will accommodate three men and an operator, and if necessary, can carry two litters. They are radio equipped, enabling communication with planes or other tractors. Windows on both the side and rear can be pushed out to form emergency exits in the ice fields, where crevasses are frequently hidden by snow bridges.

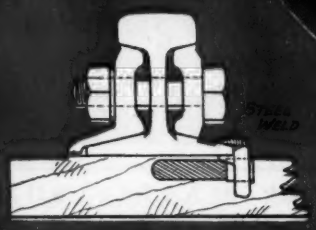
Southern Nevada Shipping Gold Ore

The first carload of gold ore shipped out of southern Nevada since the gold-mining embargo was lifted on July 1, went out early in July from the Blossom mine at Searchlight. Homer B. Mills, operating the property, says he has found plenty of ore running from $300 to $800 a ton. He expects to ship six or eight cars a month, although not all of it is expected to be of this high-grade quality.

Let O-B Type AW-19 Rail Bonds

Save 2/3

of Your Main Line Welded Bond Costs*



O-B Type AW-19 Rail Bonds may be installed on any rail 50 lbs. or heavier. Notice how bond strand lies under rail base, protected from damage due to dragging equipment or derailment.

*** Average Bonding Costs per 1000 Feet of Rail (66 Joints)**
(Based on Ten Year Period)

	LONG BOND	AW-19
Bonds	$ 66	$ 39
Installation	33	33
Power Loss Due to Bond Resistance	320	70
	$419	$142

Savings--$277 or approximately 66%

30% Less Initial Investment - Type AW-19 Bond costs approximately $40 per 100 less than long bonds. On a six-mile haulage, this savings would amount to nearly $800.

12% More Current Carrying Capacity--75% Less Power Loss Due to Resistance - Type AW-19 Bond requires but ¼ as much strand as long bond; introduces but ¼ as much resistance in return circuit. It will also carry approximately 95% of rail conductivity as compared to 83% with long bond. At average power costs, savings on six-mile haulage, would amount to $1300 yearly.

2559-M

★

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WAR BONDS

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CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONTARIO

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CRUSHER and PULVERIZER CO., ST. LOUIS 6, MO.

Antelope District Property to Reopen

Announcement is made by new operators in the Antelope district, less than 30 miles north of Reno, that a gold property said to have supplied a small mill nearly 50 years ago, is to be reopened by the newly organized Mexivada Mines Corp. The property to be worked is on the old Homestate and Mars lodes, a group of seven claims. Samples taken indicate the presence of gold and copper in profitable grade.

Goldfield Consolidated Has Expanded

The annual report of the Goldfield Consolidated Mines Company, released here by George Wingfield, president, indicates that the company has greatly expanded the scope of its operations and activities. The stock was selling around 15 cents a share two years ago and is now quoted at $1 and higher. Much of the Goldfield Consolidated property has been inactive. The balance sheet as of December 31, 1944 shows cash in bank, $176,659 and notes receivable, $51,195. Total current assets are listed at $2,828,592. Liabilities include notes payable of $391,913.

Getchell Mill to Concentrate Metals Reserve Stock Piles

Getchell Mines, Inc., is about to resume operation of its tungsten plant, which was closed July 1, 1944, due to the Government's oversupply of that metal. Getchell Mines is reported to have accepted a contract from the Reconstruction Finance Corporation to mill all stockpiled tungsten ore of the Metals Reserve Company in that area, and will place its 400-ton mill in operation as soon as possible. Operation of the Getchell gold properties is not expected to resume for some time, due to inability to obtain experienced miners and necessary machinery.

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Truck, boat, machinery; indoor and outdoor protection. Highest test duck, full weight; double sewed seams; grommets set in reinforced patches. Finest mildew, waterproof processing. All sizes. Direct factory prices. Immediate delivery. Send for literature now.

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MILWAUKEE, WIS.

Gold Mining and Taxes

A well known California gold mine operator recently had the following to say to us regarding problems now facing the gold-mining industry:

"At the moment, I believe the most important item for the gold-mining industry to consider and endeavor to bring to the attention of the Congress is the matter of taxes. The following four items should be brought forcibly to the attention of those committees of Congress which have to do with such matters as well as the Internal Revenue Department. They are:

"Rehabitation costs to put the mine in condition to get into production, deductible against taxes in productive years.

"Maintenance expenses, including State and county taxes, insurance, etc., should be deductible against taxes in productive years.

"Deferred depreciation during shutdown period should also be deductible against taxes in productive years.

"Carry-back and carry-forward provisions of the present revenue act should be changed to at least seven years instead of the present two years."

Moonlight Improves Flotation Practice

The Mesa Mining Company has altered its flotation practice so as to simultaneously remove iron and zinc sulphides from dirty tungsten concentrates, according to reports. The sulphide concentrates are rejects from the clean-up operation and show about 0.20 percent WO_3. The scheelite concentrates are reported to show over 70 percent WO_3 with a sulphur content of 0.35 percent. The Moonlight mine is in Inyo County, about eight miles west of Bishop.

Hoefling Brothers Has New Washing Plant

Completion of a new portable washing plant at Hoefling Brothers Spud Patch mine is reported. This is a tungsten placer operation at Atolia, Calif. The new unit will handle about 60 cu. yds. per hour at capacity. Placer work is all done by the operator, but subleased lode ground also helps production.

Modoc Mine Dump Being Shipped

Leo Bacoccini, a veteran Nevada mining operator, is reported to be shipping 60 to 100 tons of smelter slag daily from the old Modoc silver-lead property, 30 miles south of Ballarat, Calif. The material is reported to average about 9 percent lead, contains some silver and runs high in silica. The ore is trucked 60 miles to Keeler, loaded on narrow-gauge cars for haulage to Owenyo and is there transferred to standard-gauge cars for shipment to a Utah smelter. The Modoc was a famous producer of rich lead-silver ore some 70 years ago at which time it was operated by Hearst and Haggin. A smelter was operated at capacity for several years employing something over 300 men.

PROCEDURE HANDBOOK OF ARC WELDING DESIGN AND PRACTICE. *Eighth edition, published by The Lincoln Electric Co., Cleveland, Ohio; postpaid United States* $1.50 *per copy, elsewhere* $2.

ENTIRELY revised to include the latest data on new arc welding methods and equipment, the eighth edition of the "Procedure Handbook of Arc Welding Design and Practice" has just been announced by the publishers.

The book, which includes details of the most recent welding methods and techniques, many of which played such a dominant part in winning the European War and in assuring final victory in the Pacific, incorporates a wealth of new information that obsoletes much of the previous literature on welding.

important mining engineering organization

...invites inquiries from experienced ore mining engineers and superintendents, mechanical and electrical engineers, open cut engineers and superintendents and master mechanics. Three year contract on foreign work.

. . . Give full details of education, experience and salary expected. Write Box 100, Mining Congress Journal.

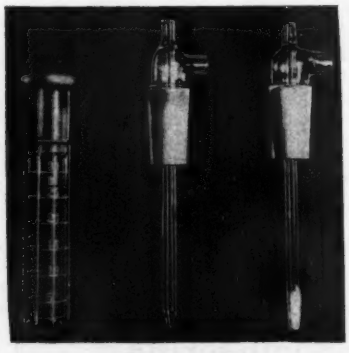
MANUFACTURERS FORUM

New Midget Impinger Sampling Units

New all-glass sampling units for use with the M.S.A. Midget Impinger have been developed and are now available, announces Mine Safety Appliances Company.

The new all-glass sampling units consist of a flask and nozzle with a standard taper ground-glass stopper. A fritted glass bubbler is also available. This equipment make possible the sampling of a wide variety of dusts, gases, and vapors.

The all-glass construction of the new impinger units is said to permit



easy and thorough cleaning and prevent contamination or discoloration of the sample undergoing test. The air outlet in these units is placed at a maximum height, and the possibility of drawing over any of the collecting fluids is practically eliminated.

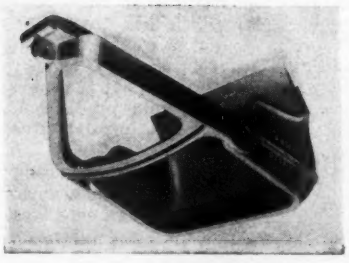
The impinger nozzle orifice is fixed at the correct height and no readjustment is necessary.

¼ and ¾ Box Scrapers

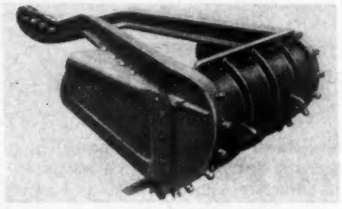
The American Manganese Steel Division of American Brake Shoe Company announces a new line of manganese steel scrapers.

Made in two types, the ¼ and ¾ Box, these scrapers are said to feature high capacity, all manganese steel construction, simplicity of design, readily renewable scraper blades, curved back and proper balance. The curved back, it is reported, aids in quickly "rolling up" capacity loads.

The ¼ box bucket is 30 in. wide and made with sides cast integral with the back. A wearing shoe protects the bail against abrasion wear.



The ¾ box bucket is 66 in. wide, 72 in. long overall, and has removable 33 in. long side plates. Wearing runners on the pulling bail afford ample protection against abrasive wear.



Details on Amsco Scraper Buckets will be sent on request to the manufacturer, main office at Chicago Heights, Ill.

Pressure Sensitive Device

Utilizing the principle that the electrical characteristics of a wire filament change with a physical strain, the Baldwin Locomotive Works' Southwark Division has developed a pressure sensitive device that promises to open whole new fields of measurement and control.

The new instrument, called the SR-4 Pressure Sensitive Device, is used to convert gas or liquid pressure to electrical energy for measuring, recording or controlling. Its extreme accuracy, one-fourth of one percent of full scale having been consistently obtained, will mean that the device can be used for control operations that heretofore have not been possible. It is available in several ranges up to 0-to-20,000 pounds per square inch.

Since it is essentially an electronic device it will enable results to be transmitted long distances whether for direct reading, recording or control. Transmission even by radio is feasible. This will eliminate leakage and clogging troubles.

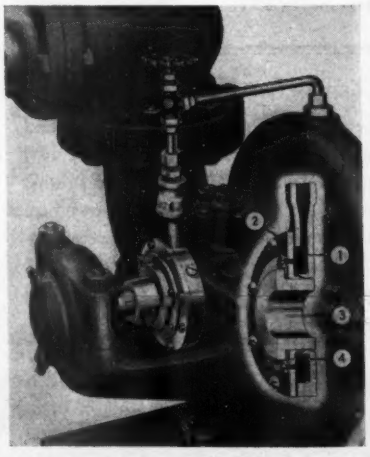
The SR-4 Pressure Sensitive Device is, as its name implies, based on the principle of the SR-4 strain gage which in the five years since its introduction has proved itself to be the most efficient instrument yet devised to give engineers accurate information on the strains and stresses of materials and structures under actual load conditions.

The heart of the device is a very fine filament wire bonded to a hollow metal core against which is exerted the gas or liquid pressure to be measured. As the pressure increases this filament stretches, thus changing the diameter of the wire and causing measurable changes in the electrical resistance of the wire.

Pump Shaft Seals

Jet shaft seals, heat resistant and non-corrosive seals for horizontal centrifugal pumping units, illustrated, are claimed by the manufacturer to save a large percentage of pump maintenance costs by eliminating waste of fluid, packing expense and the causes of sleeve and shaft wear; to provide greater continuity of pump service, and, by ending packing drag, reduce power input.

In principle the seal draws pressure from the high point and directs it back into the low pressure area of the



pump with sufficient force to seal off internal pressures. The liquid flows through (1) the liquid box, inward past (2) the orifice plate and back into the pump. Shaft sleeve (3) turns with the shaft, but is not in contact with the orifice plate, so there is no point of wear.

The diaphragm (4) provides a leakproof seal while the pump is not in operation, being pressed outward, by the pressure within the pump, against the shoulder of the shaft sleeve. There is no contact while the pump is turning, only momentarily when the pump is actually starting or stopping.

Seals are available in both bronze and stainless steel. Sizes for all pumps 1 in. shaft and over.

Jet Shaft Seals, Inc., 1452 S. San Pedro Street, Los Angeles 15, Cal.

Respirator Hoods

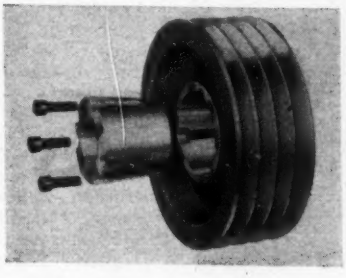
Industrial Products Company, 2830 Fourth Street, Philadelphia 33, Pa., offers a new line of full-vision respirator hoods. These new hoods are designed to give complete head protection on the many jobs and operations involving dust and spray, at the same time allowing normal, unrestricted vision.

Plastic windows are approximately 5 in. x 9 in., of the new design full vision type. They are said to be easily and quickly replaced when necessary without the use of tools. Heavy gauge (.040-in.) for impact resistance.

Taperlock V-Belt Sheave

The Taperlock V-belt Sheave just released by the Dodge Manufacturing Corporation of Mishawaka, Ind., is said to represent a new and effective means of quickly mounting and demounting V-belt sheaves.

To install the Taperlock Sheave, it is only necessary to slip the sheave and bushing assembly onto the shaft and tighten two or three locking screws, depending upon the size of the sheave. The screws are in threaded engagement with the sheave hub and free in the bushing groove. As the screws are tightened, they push against the tapered bushing, forcing it into the tapered bored hub. This causes the bushing to contract and wedge between the hub and shaft on which it is installed.



To remove the sheave from the shaft, the locking screws are removed and one or two of them are inserted in jack screw holes, which are partially in the bushing and partially in the hub. The portion of the jack screw hole in the bushing is threaded and that in the hub portion is unthreaded. As the screws are tightened, the bushing is dewedged and the sheave is free for removal from the shaft.

This construction is believed to offer many advantages: Provides a mounting of minimum dimensions for accommodation of the screws and their connection with hub and bushing; permits use of a flangeless bushing and eliminates any extension of either hub or bushing or any collars or protruding parts.

Electronic Feeder Control

Hammer mills, attrition mills, and cutters are now reported to be able to handle full production loads, through use of a new electronic feed regulator. It is believed to be no longer necessary for the operator to watch feeding and to manually regulate the feed to avoid overloads and mill choke up. The electronic regulator is designed to maintain the load on pulverizing equipment at the maximum rated capacity of the motor.

An underload light signal is placed to indicate failure of material to reach pulverizer due to empty bins or arching at some point above the feeder. Additional signals can be wired to any location.

Increases of as much as 50 percent in batch operation output were reported with these controls. Manufacturers' estimates indicate production increases of from 20 to 35 percent from each mill.

Information can be obtained by writing to Mosher Electronic Controls, 130 West 42nd Street, New York 18.

—*Announcements*—

R. A. Williams, vice president, in charge sales for American Car and Foundry Company, announces the appointment of Herman H. Pancake, sales engineer, as manager of mine car sales. He will make his headquarters in the New York General Office, having been recently transferred from the Washington, D. C., office.

H. H. Pancake

Mr. Pancake was born in Huntington, W. Va., and educated in the Huntington schools. He started his career with ACF in July, 1923, as draftsman. In 1933 he was transferred to the sales department as sales agent in the mining territory. Three years later he was appointed local engineer at the Huntington plant and subsequently as engineer in charge of mine car construction. He later served as sales engineer in the Pittsburgh office.

In his present post Mr. Pancake succeeds J. L. McDowell who recently retired at his own request from active service with ACF.

* * *

Robins Conveyors, Inc., and its affiliate, Hewitt Rubber Corporation, have opened a new office in the United Carbon Building in Charleston, W. Va.

R. U. Jackson, who has represented Robins Conveyors in the territory for 15 years, will be in charge of the office, assisted by H. N. Kepler, sales engineer formerly in the Robins Washington office.

Handling Hewitt sales will be Nelson J. Reinhold, who has recently joined the company after 14 years with Cincinnati Rubber Co.

* * *

Increased production of Mack trucks is now underway following complete lifting of wartime controls on civilian truck output, according to A. N. Morton, vice president in charge of production of Mack Manufacturing Corporation. During 1946, he stated, Mack expects to manufacture more trucks, buses, fire apparatus and marine engines than in any pre-war year.

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REDUCE FIRE HAZARDS

By interrupting overload currents which can anneal trolley wires without opening a substation circuit breaker set to trip at a high current value, I-T-E Sectionalizing Circuit Breakers strike at major causes of mine fires.
Investigate this protection which can pay returns far in excess of the original cost.
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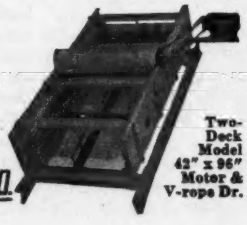

Two-Deck Model 42" x 96" Motor & V-rope Dr.

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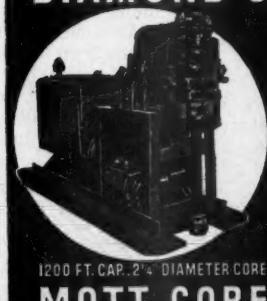

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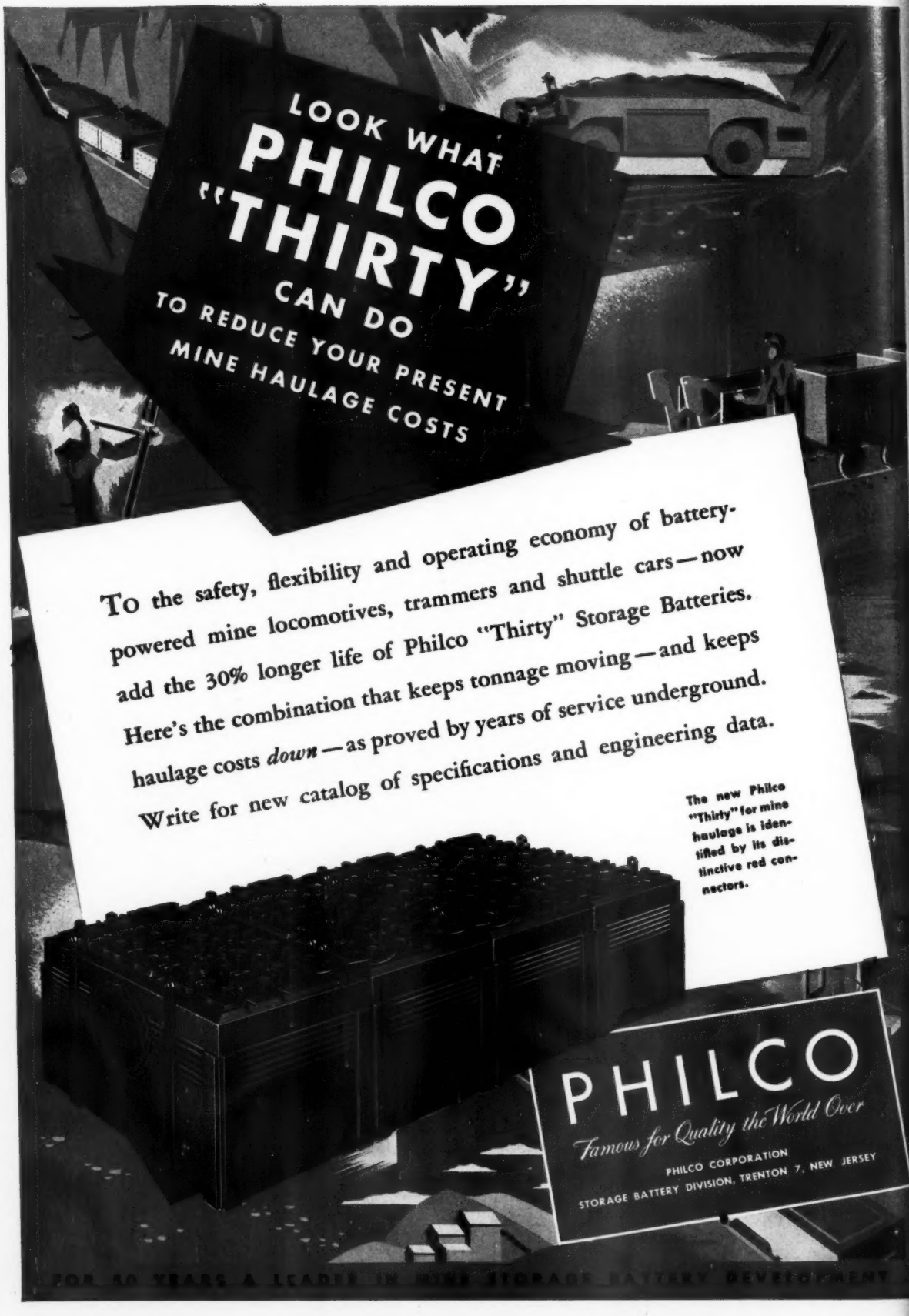
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